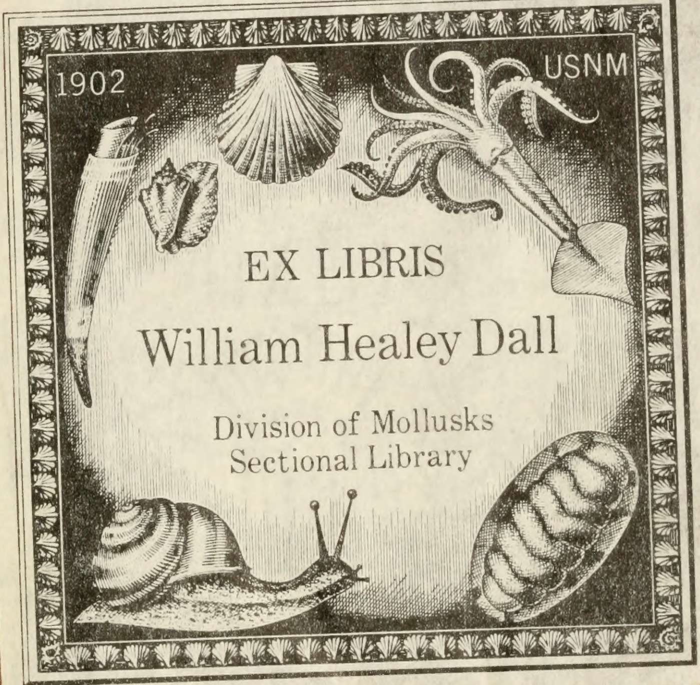
SHOUT
SHARE
IT



1902
USNM
EX LIBRIS
William Healey Dall
Division of Mollusks
Sectional Library

K-2-C FORBES

Division of Mollusks
Sectional Library

K-2-C FORBES

Sowe

EX LIBRIS
89

JOHN BROOKS HENDERSON

9/2

Division of Mollusks
Sectional Library

A
HISTORY
OF
BRITISH MOLLUSCA,
AND THEIR SHELLS.

A

HISTORY

OF

BRITISH MOLLUSCA,

AND THEIR SHELLS.

BY

PROFESSOR EDWARD FORBES, F.R.S.,

OF KING'S COLLEGE, LONDON;

AND

SYLVANUS HANLEY, B.A., F.L.S.,

OF WADHAM COLLEGE, OXFORD.

VOLUME IV.

PULMONIFERA AND CEPHALOPODA.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LIII.

SMITHSONIAN
MAY 13 1988
LIBRARIES

SMITHSONIAN
LIBRARY

LONDON:
Printed by SAMUEL BENTLEY and Co.
Bangor House, Shoe Lane.

Mollusks
QL
425
G7
[illegible]
1853
c.1
v.4
SCNHRB

CONTENTS OF THE FOURTH VOLUME,

EXHIBITING THE FINAL CORRECTIONS AND ADDITIONS.

Species of questionable indigenousness are printed in italics; spurious and unrecognized species in nonpareil. The addition of (A. i.) to a species refers the reader to the first Appendix, or Supplementary Notes on the Acephala, in the Second Volume, (A. ii.) to the Appendix at the end of the work.

PAGE

- *GASTEROPODA PULMONIFERA* 1
- ONCHIDIADÆ . . . 2
  - ONCHIDIUM . . . 2
    - O. Celticum . . . 3
- LIMACIDÆ . . . 6
  - ARION 7
    - A. empiricorum . . . 7
    - A. flavus 9
    - A. hortensis . . . 10
  - GEOMALACUS . . . 11
    - G. maculosus . . . 12
  - LIMAX 12
    - L. agrestis . . . 13
    - L. cinereus . . . 15
    - L. arborum (A. ii.) . . 17
    - L. flavus 19
    - L. brunneus . . . 20
    - L. tenellus . . . 21
    - L. Sowerbii . . . 22
    - L. gagates . . . 24
- TESTACELLIDÆ . . . 26
  - TESTACELLA . . . 26
    - T. Haliotoidea . . . 26
      - T. Maugei . . . 27
- HELICIDÆ 29
  - VITRINA 29

PAGE

VITRINA continued.

- V. pellucida . . . 30
  - V. elongata . . . 32
  - Helix brevipes . . . 32
- ZONITES . . . 32
  - Z. cellarius . . . 33
  - Z. alliarius 34
  - Z. nitidulus . . . 36
  - Z. purus . . . 37
  - Z. radiatulus . . . 38
  - Z. nitidus . . . 39
  - Z. excavatus . . . 40
  - Z. crystallinus . . . 41
- HELIX 43
  - H. aperta 43
  - H. pomatia . . . 46
  - H. arbustorum . . . 48
  - H. Cantiana . . . 50
  - H. Carthusiana . . . 53
  - H. nemoralis . . . 53
  - H. Pisana . . . 56
  - H. virgata (A. ii.) . . 57
  - H. caperata . . . 59
  - H. ericetorum . . . 61
  - H. obvoluta . . . 63
  - H. lapicida . . . 65
  - H. rufescens . . . 66
  - H. hispida . . . 68
  - H. revelata . . . 70

PAGE

Helix continued.

- H. sericea (A. ii.) 71
- H. lamellata 73
- H. aculeata 74
- H. fulva 75
- H. fusca (A. ii.) 77
- H. pulchella 78
- H. rotundata 80
- H. umbilicata 81
- H. pygmæa 83
  - Fry 84
  - H. terrestris 85
  - H. limbata 85
- Bulimus 86
  - B. acutus 86
  - B. Lackhamensis 89
  - B. obscurus 90
    - Helix stagnorum 92
    - B. Guadaloupensis 92
    - B. Goodalli 93
    - B. decollatus 93
    - B. pupa 94
    - B. Guildingii 94
    - B. ventricosus 94
    - B. zebra 165
- Pupa 95
  - P. umbilicata 95
  - P. muscorum 97
  - P. Anglica (A. ii.) 99
  - P. secale 101
  - P. edentula 103
  - P. minutissima 104
  - P. pygmæa 106
  - P. substriata 108
  - P. antivertigo 109
  - P. pusilla 111
  - P. Venetzii 112
    - P. cinerea 113
- Balea 114
  - B. fragilis 114
- Clausilia 116
  - C. laminata 116
  - C. biplicata 118
  - C. plicatula 120
  - C. nigricans 121
    - C. bidens 124
    - C. labiata 124
- Zua 125

PAGE

Zua continued.

  - Z. lubrica 125
    - Buccinum obtusulum 127
- Azeca 127
  - A. tridens 128
- Achatina 130
  - A. acicula (A. ii.) 130
    - A. octona 178
- Succinea 132
  - S. putris 132
  - S. oblonga 137

LIMNÆADÆ 139
- Physa 140
  - P. fontinalis 140
  - P. hypnorum 143
    - P. rivalis 145
    - P. acuta 146
    - P. alba 146
- Planorbis 146
  - P. corneus 147
  - P. albus 149
  - P. glaber (A. ii.) 150
  - P. Nautileus (A. ii.) 152
  - P. carinatus 153
  - P. marginatus 155
  - P. vortex 157
  - P. spirorbis 159
  - P. contortus 160
  - P. nitidus 161
  - P. lacustris (A. ii.) 162
- Limnæus 163
  - L. pereger 165
  - L. auricularius 169
  - L. Burnetti 172
  - L. stagnalis 174
  - L. truncatulus 177
  - L. glaber 178
  - L. palustris 180
  - L. glutinosus 182
  - L. involutus (A. ii.) 184
    - Turbo rivulus 185
- Ancylus 185
  - A. fluviatilis 186
  - A. oblongus 188

AURICULIDÆ 190

PAGE
Conovulus 190
C. bidentatus . . . 191
C. denticulatus . . . 194
C. Bullaoides . . . 197
C. pusillus. . . . 197
Voluta alba . . . 192
Carychium 198
C. minimum . . . 198

CYCLOSTOMIDÆ . . . 200
Cyclostoma . . . 201
C. elegans 201
C. ferrugineum . . . 204
Acme 204
A. lineata 204

CEPHALOPODA DIBRANCHIATA . . . 207

OCTOPODIDÆ . . . 208
Octopus 208
O. vulgaris . . . 209
Eledone 211
E. cirrhosus . . . 211

TEUTHIDÆ 215
Sepiola 215
S. Atlantica . . . 217
S. Rondeletii . . . 220
Rossia 221
R. macrosoma . . . 222
R. Owenii. . . . 223
Loligo 225
L. vulgaris . . . 226
L. media 228
L. marmoræ . . . 230
Ommastrephes . . . 231
O. sagittatus . . . 231
O. todarus. . . . 233
O. Eblanæ . . . 235

SEPIADÆ 237
Sepia 237
S. officinalis . . . 238
S. bisserialis . . . 241
Spirula Peronii . . . 242

PAGE

APPENDIX.

TUNICATA

Syntethys 244
S. Hebridicus . . . 245
Appendicularia . . . 245

ACEPHALA LAMELLIBRANCHIATA . . 246
Teredo Norvagica . . 246
„ navalis . . . 246
„ megotara. . . 246
Pholadidea papyracea . . 248
On the supposed ? fry of Saxicava 248
Panopæa Norvegica . . 249
Sphænia Binghami . . 250
Poromya granulata . . 250
Diodonta fragilis . . 251
Tellina balaustina . . 251
„ pygmæa . . . 251
„ proxima . . . 251
Ervilia castanea . . . 253
Mactra truncata . . . 253
Lutraria elliptica . . 253
Astarte sulcata . . . 254
Cardium pygmæum . . 254
Montacuta ferruginosa . 254
Lepton convexum . . 255
„ Clarkiæ . . . 255
Modiola phaseolina . . 256
Crenella faba . . . 256
Arca raridentata . . 257

ACEPHALA PALLIOBRANCHIATA . . 257
Terebratula cranium . . 257
Megathyris cistellula . . 257

PTEROPODA

Spirialis Flemingii . . 258
Clio 291
Clio borealis . . . 292

GASTEROPODA

Chiton Hanleyi . . . 258
„ albus . . . 258
Propilidium Ancyloide . 259
Note to Fissurella . . 259

PAGE
Trochus tumidus . . 259
Margarita aurea . . 259
Ianthina communis . . 260
Note to Neritina . . 261
Paludina Listeri, and vivipara 261
Lacuna vincta . . . 262
On Rissoæ . . . 262
Rissoa Beanii . . . 263
„ costata . . . 263
„ semistriata . . 263
„ vitrea . . . 264
„ proxima . . . 264
„ soluta . . . 265
„ ventrosa . . 266
Rissoa ? littorea . . . 265
Turbo disjunctus . . 267
Jeffreysia opalina . . 267
„ globularis . . 268
Skenea ? nitidissima . . 269
Skenea ? divisa . . 269
Skenea ? Cutleriana . . 270
Skenea ? costulata . . 271
Turritella communis . . 271
Cerithium reticulatum . 271
„ adversum . . 272
„ angustissimum ? . 272
Aclis supranitida . . 273
„ unica . . 273
Eulima polita . . . 273
On Chemnitzia, Odostomia, and Eulimella . . 273
Chemnitzia elegantissima and gracilis (or pusilla) . . 275
„ rufa . . 276
„ fulvocincta . 276
„ fenestrata . 277
„ scalaris . . 277
„ indistincta . 278
PAGE
Chemnitzia eximia . . 278
Odostomia dubia . . 279
„ Rissoides . . 279
„ insculpta . . 280
„ obliqua . . 280
„ Warrenii . . 280
„ dolioliformis . 281
„ decussata . . 281
„ Gulsonæ . . 281
On Eulimellæ . . . 283
Truncatella Montagui . . 283
Note to Murex corallinus . 283
Purpura lapillus . . . 284
Nassa pygmæa . . . 284
Buccinum Dalei . . 284
„ Humphreysianum 285
Note to Mangelia . . 286
Cylichna obtusa . . . 286
Akera bullata . . . 286
Philine quadrata . . 287
Antiopa splendida . . 287
Arion flavus . . . 287
Limax agrestis . . . 288
„ arborum . . . 288
„ flavus . . . 288
„ gagates . . . 289
Helix virgata . . . 289
„ sericea and fusca . 289
Pupa Anglica . . . 289
Achatina acicula . . 289
Planorbis lacustris . . 289
Limnæus involutus . . 290
Acme lineata . . . 290
Phyllididæ . . . 290
Diphyllidia . . . 290
„ lineata . . 290
Clio borealis . . . 292

BRITISH MOLLUSCA.

GASTEROPODA PULMONIFERA.

All the terrestrial, and the majority of freshwater Gasteropodous Mollusca, breathe air, and are provided with a pulmonary cavity, or sac, instead of gills. Over the walls of this sac the blood is distributed in minute vessels, for the purpose of being aerated. The animals presenting this organization, are all provided with distinct heads, furnished with tentacula and organs of sight. They walk by means of a well-developed creeping disk. The majority are protected by shells, but there are some which have no shell, although they do not differ materially in organization or external form. The shells when present are, in the majority of cases, spiral or discoid, and external, in a few instances patelliform; when imbedded in the substance of the mantle, they are unguiform. The embryos have, or have not, shells, according as the adult is to be shell-bearing or naked. Distinct ciliated lobes are not seen upon them, though in the egg they are partially clothed with cilia on the analogous portion of their bodies, and exhibit movements. The number of known Pulmoniferous Mollusks is very great. They inhabit all climates, and display variations of colour and form that bear a remarkable relation to their geographical distribution. A few genera and species are of maritime habits, requiring the presence of sea-water for their existence, though, if kept immersed, they would perish.

ONCHIDIADÆ.

Most of the animals composing this family are true sea-slugs, breathing by means of a pulmonary cavity, but living immediately in contact with marine conditions. Certain forms of them live, however, inland, under old wood, and in gardens. They are almost all tropical creatures, and little known to the naturalists of Europe. They are unprovided with shells, and have their dorsal surface entirely covered with a fleshy disk or mantle. In aspect they closely resemble some of the *Elysiadæ*, and constitute a very natural link between the *Gasteropoda opisthobranchiata* and the *Gasteropoda pulmonifera*.

ONCHIDIUM, Buchanan.

Animal oblong; unprovided with a shell, completely covered above by a convex, coriaceous, usually tuberculated, rarely smooth mantle. Head provided with two retractile tentacles, bearing the eyes at their extremities; mouth covered by a buccal veil; no horny jaws, a denticulated tongue. Sexes combined; orifices of reproductive organs widely separated. Pulmonary orifice posterior, and respiratory cavity placed behind the heart. Vent posterior.

This genus was founded by Buchanan for an animal observed by him in Bengal. Cuvier first clearly developed its structure, and published an elaborate memoir on its anatomy. The species are almost all inhabitants of tropical regions.

O. Celticum, (Cuvier ?) Couch.

Plate F. F. F. fig. 6.

This most interesting addition to the British Fauna was discovered by Mr. Couch, a naturalist who has done much to extend our knowledge of the marine animals of the British seas, on the coast of Cornwall. He found it abundantly on a confined space of rocks at West Coomb, in Lantivet Bay, between Polperro and Fowey, congregated in little groups, about a foot or two from the surface of the sea, where the waves break over them. These curious creatures ascend and descend, so as to maintain their distance as the tides rise and fall. They will not, however, bear long immersion in sea-water. Cuvier, in the "Règne Animal," notices, without describing it, an *Onchidium* under the name of *Celticum*, from the coasts of Brittany. This was, very probably, identical with Mr. Couch's species; we therefore adopt, for the present, the name *Celticum*, as appropriate and significant.

A living specimen, submitted to our examination by Mr. Alder, measured rather more than half an inch in length. Its form was oblong. Its cloak was of a black hue, rather shining, thick and coriaceous, and covered with short, thick, rounded tubercles, surrounded by smaller ones; the margin of the cloak considerably surpassed the foot; the under side of the margin was minutely granulated. The foot was oblong, and of a pale yellowish-grey colour. The head bore two short retractile tentacles, with eyes on their swelling tips; these are set above the rounded pale oral lobes or veil.

The following very interesting remarks on the anatomy of this *Onchidium*, have been kindly communicated to us by Mr. Albany Hancock.

"I have not yet completed my dissections of this animal, but from what I have already ascertained, it is evident that it is formed on the type of the *Pulmonifera*. The ganglia of the nervous system have much the same arrangement as they have in *Arion*. But the digestive apparatus shows one or two interesting modifications. The buccal mass is well developed; there are no horny jaws; the tongue is broad, and composed of upwards of seventy transverse rows of obtuse. slightly curved teeth —each row contains one hundred and eight teeth, and is divided by a minute central tooth of a triangular form, bearing a single obtuse spine. The reproductive organs are conjoined in the same individual; the male intromittent organ is, however, placed at the right side of the head, whilst the other parts are situated at the posterior extremity of the body. The male and female parts are nevertheless connected by a long, slender duct, buried in the muscles at the side of the foot.

"The most interesting feature in the anatomy of *Onchidium*, is the position of the heart and breathing-organ in relationship to each other. The lung being placed, in this animal, at the posterior extremity of the body, has, consequently, the heart in *front* of it. In *Arion*, *Helix*, and, probably, in all the other *Pulmonifera*, the blood-propelling organ is situated *behind* the breathing apparatus, which, in these animals is placed in an anterior position. Thus we find that *Onchidium* differs from the other *Pulmonifera*, in the same manner as the *Opisthobranchiata* do from the *Prosobranchiata*, so far, at least, as the relative position of these organs is concerned. And, moreover, it is worthy of remark, that in *Onchidium* the anal orifice is distinct from that of the lung, and that in *Arion* and *Helix* the excretory apertures are within the pulmonary arch. The true signification of these facts can scarcely at present be determined; more information is required respecting *Onchidium* and its allies, to throw additional light upon the subject."

LIMACIDÆ.

The land-slugs are elongated, semi-cylindrical, soft, or fleshy creatures, either unfurnished with shells, or provided with the rudiments of them, imbedded in the cloak, or disk, which covers the anterior portion of the body. This disk covers the respiratory cavity, the orifice of which, and the vent, are seen at its right margin. The generative orifices vary in different groups. All the slugs have a retractile head, four tentacles, also retractile, the two upper ones provided with eyes. Their skin secretes abundant mucus. They are herbivorous by preference, but carnivorous when taste or necessity prompts them. They are crepuscular or nocturnal in their habits.

The dentition of the *Limacidæ*, and of all our native *Pulmonifera*, has been made the subject of elaborate investigation, by Mr. William Thomson, of King's College, London. The general results of his researches are given in a very excellent memoir, read before the British Association in 1850, and published in the seventh volume of the second series of the Annals of Natural History. They would appear to influence very importantly, our conclusions respecting the disposition and affinities of the pulmoniferous genera. The edge teeth in this family have a long projecting single apex.

ARION, Ferussac.

Animal elongated, semi-cylindrical, furnished anteriorly with an oblong disk. Head with four tentacula, the two upper ones furnished with eyes; mouth with a serrated corneous tooth. Respiratory orifice at the anterior margin of right side of the disk; the vent immediately behind it. Orifice of reproductive organs immediately below the respiratory aperture. Posterior extremity of body rounded, terminating by a slight truncation, and a mucus pore. Shell undeveloped; a few calcareous granules sometimes imbedded in substance of shield.

Besides the above differences, the slugs of this genus differ in several important anatomical characters, from those of the next group. Their habits are similar.

A. EMPIRICORUM, Ferussac.

Body bulky; shield ovate; margin of foot expanded and lineated; mucus pale.

Plate D. D. D. fig. 4.

Limax ater, albus et succineus, Müller, Hist. Verm. vol. ii. pp. 2, 4, 7.
„ „ *rufus et subfuscus*, Draparnaud, Moll. de France, pp. 122 and 123, pl. 9, f. 3, 4, 6, 8.
Arion „ Gray, Man. p. 104. — Alder, Cat. Northumb. Moll. p. 29. — Macgillivray, Moll. Aberd. p. 73. — Nunneley, Leeds Trans. vol. i. pl. 1, f. 1.
„ *empiricorum*, Ferussac, Hist. p. 60, pl. 1 to 3. — Bouchard Chantereaux, Mem. Soc. Ag. Boul. 2nd ser. vol. i. p. 157.— Brown, Ill. Brit. Conch. p. 55.

This very common, beautiful, and exceedingly variable, slug, has been so cut up into false species, on account of its caprices of colour, that we deem it right to follow the example of Ferussac, and to give it a name which may equally apply to all its varieties. It is usually from three to five inches in length when crawling. Its shape then is lanceolate, bulky, and rounded; when at rest it is much contracted, and elevates its back into a prominent hump, that rises above the shield. The head is rather stout, and bears two moderately long upper, and two rather short lower tentacles, all dark blue; between them two dark lines are traced on the forehead, sending branches to the upper ones. The disk or shield is slightly truncated in front, rounded behind; its surface is minutely granulate; its orifice is placed antero-laterally. The back of the body is rounded, very convex, and wrinkled with strongly carinated long prominences. The terminal ones are elevated above a triangular grey flattened space occupied by the mucous gland. The margin of the foot is membranous and expanded, and at the tail it is still wider, and emarginate or truncate. The colour is exceedingly variable and often very brilliant. In open fields, this slug is often of a jet black; in woods, a variety occurs, occasionally nearly white, or tinged on the back with pale yellow only. It is frequently found of a general reddish-brown, and sometimes entirely orange, or dusky on the shield and back, with orange sides. The margin of the foot is almost always yellow, often bright orange, and lineated either with transverse black or deep orange or red lines. The lips are orange. There is a small variety, white or dusky, found not unfrequently in the neighbourhood of gardens, remarkable for having a dusky, or nearly black line, on each side of the centre of the shield, and a corresponding line on each side of the back. We cannot make out clear distinctions of specific value, however, for this form. In the shield of the common *Arion* calcareous particles often occur. The eggs are thick-skinned, yellowish, oblong, and rather large. They may be found under large stones, or logs of wood, abundantly in autumn. The young when it comes out, is of a speckled yellowish-fawn colour. Mr. Nunneley remarks that it lives much longer than the *Limaces*. It is universally distributed in the British Isles, and has a wide range throughout Europe.

A. FLAVUS, Müller.

Resembling *Arion empiricorum*, but more elongated, the disk more oblong; secreting a yellow mucus.

Plate F. F. F. fig. 2.

Arion flavus, FERUSSAC, Hist. Moll. Suppl. p. 96 B. No. 7.—BOUCHARD CHANTEREAUX, Mem. Soc. Ag. Boul. 2nd ser. vol. i. p. 159.—ALDER, Cat. Moll. Northumb. p. 30.
Limax „ MÜLLER, Verm. vol. ii. p. 10.—NILLSON, Moll. Scand. p. 5.

We figure this *Arion* from a drawing kindly communicated by Mr. Alder, by whom it was first recorded as British, in the Catalogue of the Mollusca of Northumberland and Durham. Of it he states, "Our individual was about an inch in length, with the body whitish, having a faint greyish tinge above. The shield and the posterior parts of the body near the tail, were of a pale canary-colour. Tentacles greyish-white. The mucus was deep orange-yellow." A specimen taken "at the side of the turnpike road, Westgate hill," in the same district, by Mr. J. Blacklock, was rather darker, more greenish in colour on the back, and more orange in the shield. The upper tentacles, through some malformation probably, were eyeless. M. Bouchard Chantereaux considers this species very distinct from *Arion empiricorum*. He describes it as yellowish or grey; mantle short, rounded at its extremities, finely granulated; tail orange or yellow;

head blackish; tentacula short, thick, and very black; lateral bands of the sole yellow; mucus abundant, thick, of an orange-yellow colour; length thirty millimetres. He states that it is unprolific, and lays its eggs from September to December. They are oval, opaque, and yellowish. It lives in moist and mossy places. We have never been so fortunate as to meet with an *Arion* answering to this description.

A. HORTENSIS, Ferussac.

Body slender; shield oblong; margin of foot narrow and plain; mucus yellow.

Plate F. F. F. fig. 1.

Arion hortensis, FERUSSAC, Hist. p. 65, pl. 2, f. 4, 6; and pl. 8, f. 1, 2, 4.—BOUCHARD CHANTEREAUX, Mem. Soc. Ag. Boul. 2nd ser. vol. i. p. 160.—GRAY, Man. p. 107.—ALDER, Cat. Northumb. Moll. p. 30.—BOUILLET, Moll. Auvergne, p. 13.—BROWN, Ill. Brit. Conch. p. 55.

Limax circumscriptus, JOHNSTON, Edin. Phil. Journ. vol. lxxvii.

„ *fasciatus*, NILLSON, Moll. Suec. p. 5.—KICKX, Moll. Brab. p. 4.

This beautiful little slug is very inferior to our common *Arion* in dimension. It is more elongated, and semi-cylindrical, preserving a nearly equal breadth throughout, and when at rest, does not contract its body, or hump its back nearly so much. It is usually, when crawling, about an inch, or an inch and a half in length, but grows longer. The head is small, and generally very dark, being of a dusky blue colour, as well as the short superior tentacles; the lower ones, and cheeks, are of a lead blue. The shield is oblong, roughly granulated, varying in colour, but mostly dark striped in the centre, and along the margins, so that two pale bands appear to streak it on each side of the middle; its orifice is centro-lateral. The back and hinder portion of the body are similarly marked in fasciated individuals; in some, they are of an intense blue-black, with little trace of bands; the surface is covered with oblong slightly carinated wrinkles, which are dusky, and mottled with minute white specks. The sides of the foot are pale or white, very narrowly margined at the sole, with plain grey or orange. The tail-margin is lanceolate, not expanded and obtusely pointed.

This species is, probably, common in gardens throughout the greater part of Britain, though not generally noticed. It is common around London, and equally so, according to Mr. Alder, in Northumberland. It is also frequent in Ireland.

The eggs of the *Arion hortensis* are stated by M. Bouchard Chantereaux, to be phosphorescent during the first fifteen days after they have been laid.

GEOMALACUS, Allman.

Animal elongated, semicylindrical, dorsally carinated, furnished anteriorly with an ovate disk, in which is imbedded an unguiform shell. Head with four tentacula, the two upper ones furnished with eyes. Respiratory orifice at the anterior margin of the right side of the disk. Reproductive orifice near the base of the right inferior tentacle.

This remarkable, and very distinct genus differs from *Arion* in the position of the reproductive orifice, and from *Limax* in the presence of a caudal gland, and the position of the spiracle. As yet a single species only presenting these characters has been found, and that confined to the south-west of Ireland.

G. MACULOSUS, Allman.

Plate F. F. F. fig. 5.

ALLMAN, on Animals, Nat. Hist. vol. xvii. p. 297, pl. 9.

This most remarkable and most interesting of our native slugs, was discovered by an active and indefatigable Irish naturalist, Mr. William Andrews, of Dublin, during the autumn of 1842. He found it quiescently stretched on rocks around Lough Carogh, to the south of Castlemain Bay in the county of Kerry in Ireland. To quote the words of Professor Allman, to whom it was communicated for examination and description by its discoverer, "it is an exceedingly beautiful animal, measuring, when creeping about, two inches in length; the colour of the shield and upper part of the body is black, elegantly spotted with yellow; the under surface of the foot light yellow, and divided into three nearly equal bands; the edge of the foot is brown, with transverse sulci." A white spotted variety also occurs. It can elongate itself, so as to assume the appearance of a worm, and thus enter exceedingly small apertures. It is to be hoped that this curious creature may yet be found in other localities. If we may venture a surmise, we expect that it will prove hereafter to be an Asturian as well as Irish slug.

LIMAX, LINNÆUS.

Animal elongated or oblong, semicylindrical, rounded, or carinated posteriorly, anteriorly furnished with an oblong disk, in which is imbedded an unguiform shell. Head with four tentacula, the two upper ones furnished with eyes; mouth, with a trilobed corneous tooth. No mucous gland on tail. Respiratory orifice towards the posterior margin of the right side of the disk, the vent immediately behind it. Orifice of the reproductive system near and behind the right superior tentacle. Tail without a mucous pore.

The species of slug have not been examined with the attention they deserve, and there are several forms recorded by continental authors, which may possibly still be detected in Britain, especially in the south of England, though we have failed to find any others than those here described.

The best paper on our native *Limaces* is that "On the species of *Limax* found in Ireland," by the Rev. B. J. Clarke, and published in the twelfth volume of the Annals of Natural History.

L. AGRESTIS, Müller.

Back rounded, tail obliquely carinated; shield wrinkled, rounded behind; colour pale or dark grey, mottled. Mucus milky.

Plate D. D. D. fig. 2.

Limax agrestis, MÜLLER, Verm. vol. ii. p. 8.—LINNÆUS, Syst. 1082. —DRAPARNAUD, Hist. p. 126, pl. 9, f. 9.—FERUSSAC, Hist. p. 73, pl. 5, f. 7–10.— FLEMING, Brit. Ann. p. 256. — BOUCHARD CHANTEREAUX, Mem. Soc. Ag. Boul. 2nd ser. vol. i. p. 66. — GRAY, Man. p. 117, pl. 3, f. 17. — CLARKE, Ann. Nat. Hist. vol. xii. p. 338, f. 129 B. — NUNNELEY, Leeds Trans. vol. i. p. 48, pl. 1, f. 4.—MACGILLIVRAY, Moll. Aberd. p. 77.—BROWN, Ill. Brit. Conch. p. 56.
Limacella concurva (SHELL), BRARD. Moll. Par. pl. 4, f. 5, 6, B. 14, 15.
Limacellus obliquus, TURTON, MAN. p. 26, pl. 3, f. 17.

The most mischievous and abundant of all slugs is this small, but voracious species, which abounds everywhere in fields and gardens, devouring leaves of vegetables, and their roots also, with an appetite altogether disproportioned to its size. It scarcely ever exceeds an inch and a half, or two inches at most, in length, and is more of a spindle shape than its congeners. The head is of an amber colour, or yellowish-grey, with two dusky lines running outwards to the slightly dusky, and rather short superior tentacles. The shield is slightly emarginated in front, truncate behind, obovate-oblong, concentrically wrinkled, with a large spiracle placed well back. The back is rounded centrally, carinated (obliquely) towards the acute tail; its surface is reticulated with depressed smooth wrinkles. The sides of the foot are white, with a translucent edge. The sole is white. The usual colour of shield and body is pale yellowish, or fleshy grey, with pale dusky mottlings. Occasionally, however, we meet with specimens in which the markings are brown, or even nearly black, so as to give a dark aspect to the whole body. The substance of this slug is remarkably fatty to the feel. Its mucus is milky. Remarkable peculiarities are described by Mr. Nunneley, as occurring in the reproductive organs of this little slug. It is the most prolific of all its tribe, producing several families in a year; and no wonder that it should be so abundant, when M. Bouchard observed two individuals lay no fewer than three hundred and eighty eggs! These eggs are globular and transparent.

The shell is very small, not much exceeding three lines in length, more or less tumid, convex above but not beneath; scarcely, or not at all nacreous, provided with a membranaceous margin. The more symmetrical examples are of an oblong-quadrate figure, with rounded angles, slightly broader below than above, the sides of nearly equal length, the base bluntly rounded, the apicial prominence not quite terminal, and below the level of the anterior side.

L. cinereus, Müller.

Back rounded, except near tail, which is carinated; shield pointed behind, wrinkled; colour cinereous, spotted with black; upper tentacles long. Mucus colourless.

Plate D. D. D. fig. 1.

Limax maximus cinereus, Lister, Ex. An. t. iii. f. 6–10.
„ *cinereus*, Müller, Verm. vol. ii. p. 5. — Draparnaud, Hist. p. 124, pl. 9, f. 10. — Fleming, Brit. Anim. p. 256. — Bouchard Chantereaux, Mem. Soc. Ag. Boul. 2nd ser. vol. l. p. 161. —Macgillivray, Moll. Aberd. p. 76.—Nillson, Moll. Suec. p. 6.—Blainville, Malac. Man. pl. 41, f. 5.
„ *maximus*, Linnæus, Syst. Nat. 12th ed. p. 108.—Gray, Man. p. 112.—Thompson, Ann. Nat. Hist. vol. vi. p. 17. — Clarke, Ann. Nat. Hist. vol. xii. p. 333, t. 10, f. 1. — Brown, Ill. Brit. Conch. p. 55, pl. 58, f. 8; and pl. 59, f. 1.
„ *cinereo-niger*, Wolf, in Sturm. Fauna, pt. 1 (fide Menke).
„ *antiquorum*, Ferussac, Hist. p. 68, pl. 4, f. 1–8; and pl. 8 a. f. 1. — Sowerby, Genera, and Reeve, Conch. Syst. pl. 1.
„ *maculatus*, Nunneley, Leeds Trans. vol. i. p. 46, pl. 1, f. 2.
Limacella parma (shell), Brard. Moll. Paris, pl. 4, f. 1, 2, 9, 10.

This is the largest and most beautiful of all the British slugs. It grows to a length of six inches, or even more. Its head is pinkish-grey, yellowish on the neck, with a dark central line, and obscure mottlings. The upper tentacles are yellowish-grey, and longer in proportion than in any other of our slugs; the lower ones are short. The shield is obovate-oblong, rounded in front, triangular or pointed behind; its surface is finely wrinkled concentrically; the spiracle is placed far back. The back is rounded, except at the tail, where it is carinated; it is entirely covered with strong longitudinal waved wrinkles. The tail is tapering, acute, and gradually declining to the end. The sole of the foot is dusky yellow. The colour of the shield and back in this species is very variable; the individual we have figured was of a yellow colour, closely and reticulately mottled with black on the shield, and striped with four broad black lines along the back. Frequently these black bands are broken up into larger or smaller spots of different degrees of intensity. In some examples the ground colour is reddish brown. The shell is comparatively large, measuring usually five or six lines in length, and about half that breadth, thin, depressed, slightly concave within, more or less pearly, white, with usually a very slight tinge of pink or cream-colour, and marked with rather prominent lines of growth. In the more characteristic examples, the extremity where the subcentral apophysis of adhesion lies, is subtruncated; the opposite end is somewhat rounded, and often more attenuated. The outer edge is membranaceous The straighter is the more produced side. The mucus is colourless. The eggs are very slightly oblong, about one-fifth of an inch in length, and of a yellowish white tinge; they are laid in adhering clusters.

This fine species is generally distributed through the British Isles, and common everywhere in suitable places. It may be found about houses, in gardens, and especially under decaying logs of wood. When at rest, it (as seems to be the case also with *Limax flavus*) does not contract its body into a semicircle, like most of the *Limaces*, but often curls its tail along its side, and withdraws its head, so as to form an oblong mass. It appears to be generally distributed over the European continent, and was one of the first animals of its tribe that attracted the attention of geologists and anatomists.

L. ARBORUM, Bouchard Chantereaux.

Back rounded, carinated at tail; shield wrinkled, pointed behind; colour cinereous, striped or mottled with dusky; upper tentacles much shorter in proportion than those of *cinereus*. Mucus colourless.

Plate E. E. E. fig. 2.

Limax arborum, BOUCHARD CHANTEREAUX, Mem. Soc. Ag. Boul. 2nd ser. vol. i. p. 164.—ALDER, Cat. Moll. Northumb. p. 31.
„ *arboreus*, CLARKE, Ann. Nat. Hist. vol. xii. p. 334, pl. 11, f. 4–10.—BROWN, Ill. Brit. Conch. pl. 68, f. 1, 2; and pl. 59, f. 9–13.
„ *salicetum*, BOUILLET, Cat. Moll. Auvergne, p. 18?
„ *marginatus*, MÜLLER, Hist. Verm. vol. ii. p. 10?—MACGILLIVRAY, Mol. Aberd. p. 78?

The tree-slug bears a considerable resemblance to a small individual of *cinereus*. But when we compare them closely, many differences become evident, especially the much smaller superior tentacles, and the less pointed posterior margin of the shield. Its head is yellowish, or yellowish-grey, with a dusky, often dark line, down the centre, and two other paler ones passing up the centres or sides of the superior tentacula. There is also a transverse dark band across the forehead. The shield is oblong, and slightly obovate, shortly pointed behind, rather coarsely concentrically wrinkled; its spiracle is placed farther back than in *cinereus*; its colour is yellow or grey, with a central irregular dusky band, and two lateral darker stripes. The back is rounded except towards the tail, where it is sharply and wavily carinated; it is covered with coarse, but rather depressed, slightly carinated and waved wrinkles. Its colour is ashy, or pinkish-grey, or yellowish, with more or less distinct dusky or dark mottled bands down each side, and leaving a light central stripe, at first sight resembling a keel. The dark markings sometimes form two stripes, or two rows of blotches on each side. The sides of the foot are pale, sometimes nearly white; the sole is white. The mucus is quite colourless. The shell varies much, some examples being thick, others thin; it is white, pearly, irregular, slightly convex above, and concave below, with straightish sides, and a not much arcuated base. The eggs are oval, and are laid separately. The tree-slug grows to a length of rather less than three inches. It lives on trees, especially old and decaying ones, eating the wood. It may be found on the ground under fallen trunks, and loose stones in the immediate neighbourhood of trees. Young individuals let themselves down from branches by threads of mucus, and in that condition, probably constituted, as has been suggested by M. Bouchard, the *Limax filans* of Hoy, Shaw, and Latham. The tree-slug has been overlooked on the British trees, until attention was called to it in the excellent memoir of Irish Limaces by the Rev. B. J. Clarke, who found it widely distributed in Ireland, almost always on trees. According to Mr. Thompson of Belfast, it is common in the north of Ireland. We have found it of a large size near Cork.

In Scotland it appears to be the slug from Aberdeen described, by Professor Macgillivray, as the *marginatus* of Müller. Mr. W. Thompson has found it in Islay.

In England, Mr. W. Backhouse, and Mr. R. Embleton communicated it to Mr. Alder, from localities in Northumberland. Mr. Byerly finds it abundant on trees in the neighbourhood of Liverpool. Mr. W. Thompson has met with it in the Isle of Wight, and we have found it ourselves in Surrey. It is probably a generally distributed species, often passed over for the young of *cinereus.*

L. FLAVUS, Linnæus.

Back rounded, carinated at tail; shield rounded behind, wrinkled; colour yellowish, spotted with dusky; tentacles blue. Mucus slightly yellowish.

Plate E. E. E. fig. 1.

Limax flavus, LINNÆUS (not of MÜLLER).—NILLSON, Moll. Suec. p. 5.—GRAY, Man. p. 114, pl. 5, f. 16.—CLARKE, Ann. Nat. Hist. vol. xii. p. 338 t. 11, f. 11, 12.—BROWN, Ill. Brit. Conch. p. 55.
„ *variegatus*, DRAPARNAUD, Hist. p. 127.—FERUSSAC, Hist. p. 71, pl. 5, f. 1–4.—BOUCHARD CHANTEREAUX, Mem. Soc. Ag. Boul. 2nd ser. vol. i. p. 163.—MACGILLIVRAY, Moll. Aberd. p. 76.—NUNNELEY, Leeds Trans. vol. i. p. 47, pl. 1, f. 3. —GRIFFITH, Cuv. pl. 35, f. 3.
„ *cinereus, var.* Y. MÜLLER, Hist. Verm. vol. ii. p. 6.
Limacella unguiculata, BRARD. Moll. Par. pl. 4, f. 3, 4, 11, 12.
Limacellus variegatus, TURTON, Man. p. 23, pl. 3, f. 4.

The cellar-slug is a large, fleshy species, attaining a length of four or five inches, or even more. Its head is comparatively small, and bears rather short tentacula, remarkable (as well as the neck) for their pale blue colour. The shield is oval-oblong, finely wrinkled concentrically or transversely, truncate in front, subtruncate or rounded behind; its respiratory orifice is postero-lateral; its colour is usually ash-grey, with numerous pale yellow spots. The back is rounded and full, its surface scored with reticulated furrows, the wrinkles between which are slightly carinated and obscurely crenate. The colour of the back is ash-grey, with yellow blotches. The tail is obtuse, and carinated above. The margins of the foot, the sole of which is white, are yellowish-white. The mucus is colourless. The shell is four or five lines long, very thin, nearly oval or oboval, white, much arcuated in front, tolerably straight behind, neither attenuated, nor rounded, but blunt, at the base; its apophysis of adhesion is rather prominent in the more characteristic examples, and situated rather behind the middle.

In his account of the anatomy of this species, Mr. Nunneley mentions that it possesses an additional loop of intestine, in other respects its internal organization is closely similar to that of *cinereus*. Its eggs are not quite so large.

The cellar-slug inhabits damp places in houses, especially vaults. It is found in most of our great cities, and is, probably, generally dispersed through our towns, large and small. It is a gregarious species.

L. BRUNNEUS, Draparnaud ?

Back rounded except at the tail, which is carinated; shield wrinkled; colour uniform dark brown. Mucus colourless.

Plate F. F. F. fig. 4.

Limax brunneus, DRAPARNAUD, Hist. p. 128 ? — BOUCHARD CHANTEREAUX, Mem. Soc. Ag. Boul. 2nd ser. vol. i. p. 168. — JOHNSTON, Trans. Berwick. Club, vol. i. p. 154. — GRAY, Man. p. 117. —ALDER, Cat. Moll. Northumb. p. 32.
Limacella concava (SHELL), BRARD. Coq. Paris.

This little noticed slug was first added to our fauna by Dr. Johnston of Berwick. It appears to be not uncommon, according to Mr. Aldèr, in the damp woods of the north-east of England. Our figure was communicated by Mr. Alder, who remarks that it is quite distinct from its near ally *Limax agrestis*, and very constant in its characters. It is a very small species, about or less than an inch in length when crawling. It is entirely of a dark chocolate brown colour, approaching black; head, shield, and body alike. The shield is oblong, rounded behind, concentrically wrinkled. The back is rounded, except near the tail, where it is carinated. Its mucus is abundant, and quite transparent. M. Bouchard Chantereaux states that its eggs, of which it lays no more than from twelve to eighteen, during a period of from six to eight days, are ovato-rotund, colourless, and transparent, The fry are reddish, and do not attain their maturity, until about seventy days after birth, when they are of their characteristic colour. This slug is active and fearless. It lives in moist places under stones and among herbs. It will probably be found in many more British localities. Some small slugs gathered by Mr. W. Thompson at Dunvegan Castle, in Skye, appear to belong to this species.

L. TENELLUS, Müller.

Back rounded, compressed near the tail; shield wrinkled; colour yellow. Mucus yellow.

Plate F. F. F. fig. 3.

Limax tenellus, MÜLLER, Verm. vol. ii. p. 11.—DRAPARNAUD, Hist. p. 127 ?—NILLSON, Moll. Suec. p. 10. — ALDER, Cat. Moll. Northumb. p. 31.

This is the rarest of all our slugs. Only one specimen has yet been found in Britain, met with by Mr. Blacklock in a wood at Allansford, near Shortly Bridge, in Northumberland, and by him communicated to Mr. Alder, who has kindly permitted us to engrave his drawing of it,—a favour the more to be valued, since there is no published figure of the species, either in British or foreign works. The following description combines the observations of Alder and of Nillson. In size it is one of the smallest species, not exceeding an inch and a quarter in length. The colour of the British example was a pale dull yellow, very transparent and lubricous, with an obscure band on each side of the shield and back, the tentacles being black. Nillson and Drapernaud notice a greenish tinge. In shape it is slender and rounded. The shield is rounded behind, and covered with fine concentric wrinkles. The back is rounded, but compressed towards the tail. The mucus (this character is especially to be noted) is orange-coloured.

Limax tenellus of Müller, is referred to the genus *Arion*, by MM. Ray and Drouet, in their catalogue of the Mollusca of Champagne. It is possible that they have mistaken the fry of *Arion hortensis* for this species. We have found them in numbers at Monkstown on the wet surfaces of trees after a shower, and when small they bear a striking aspect to *Limaces*.

L. SOWERBII, Ferussac.

Back carinated throughout; shield granulated; tawny or ochre yellow, with dusky markings; keel of back yellow.

Plate E. E. E. fig. 3.

Limax Sowerbii, FERUSSAC, Hist. p. 96, pl. 8 D. f. 7, 8.—DENSON, in Mag. Nat. Hist. vol. vi. p. 694. — CLARKE, Ann. Nat. Hist. vol. xii. p. 338, pl. 12, f. 14, 15. — ALDER, Cat. Moll. Northumb. p. 31.

„ *carinatus*, GRAY, Man. p. 115, pl. 3, f. 17.—THOMPSON, Ann. Nat. Hist. vol. vi. p. 208.—BROWN, Ill. Brit. Conch. p. 55, pl. 58, f. 6; and pl. 59, f. 14.

„ *marginatus*, DRAPARNAUD (not of MÜLLER), Hist. p. 124, pl. 9, f. 7.

Of our two keeled slugs, this is the largest and stoutest;

when crawling it is oblong-elongated; when at rest the keel rises suddenly and loftily above the shield. The general ground colour is ochraceous or tawny yellow, on which dots and clouds of grey and dusky are variously disposed. The keel of the back is always pale or bright yellow. The head is rather short, ash-grey above, with two dark neck lines; the tentacles are violet blue; the sides of the head yellow. The shield is oblong, widening behind, obtuse at both ends, granulated all over, ochry yellow with grey specks, a dark centro-posteral line, and two lateral ones, which are curved and connected towards its front part. The orifice is postero-lateral. The sides of the back are always more or less marked and clouded with dusky green, but the margins of the foot are pale. The sole is grey centrally, definitely edged with yellow. The reticulations of the back are granulated. Two to three inches is a usual length for this slug. The shell is very small, solid, flat or concave above, convex beneath, without a conspicuous membranaceous margin. It is commonly from two to three lines long. The mucus is colourless.

In gardens and shady places around London, this slug is common. It seems to get scarcer as we proceed northwards. Mr. Alder records it as found by Mr. W. Backhouse, near Benwell, in Northumberland. In Ireland, Miss Ball found it at Youghal; Dr. Ball finds it abundant around Dublin. We have taken it plentifully at Monkstown near Cork.

A careful perusal of the description and inspection of the figure given by Draparnaud, of the slug which he proposed to identify with the *marginatus* of Müller, scarcely permits us to doubt that this was the species intended. To Ferussac it was communicated by Sowerby.

Leach had noticed it, and described it under the name of *carinatus*, but no published account or figure, except that of Draparnaud preceded Ferussac's, whose name besides is best.

L. GAGATES, Draparnaud.

Back carinated throughout, shield granulated; dark lead colour, with pale sides.

Plate D. D. D. fig. 3.

Limax gagates, DRAPARNAUD, Hist. p. 122, pl. 9, f. 1, 2. — FERUSSAC, Hist. p. 75, pl. 6, f. 1, 2.—CLARKE, Ann. Nat. Hist.—BROWN, Ill. Brit. Conch. p. 56, pl. 58, f. 4, 5.

The general colour of this curious slug is lead-grey, sometimes very dark, occasionally slightly greenish, becoming lighter towards the sides, and near the margin of the foot almost white. When crawling, it is of an elongated lanceolate shape, very tapering towards the tail. When at rest, it is contracted into a semicircle, the sharp-edged back gradually rising from the large shield. The head is rather large, bluish-grey, with darker tentacles. The shield or disk is oblong, obtuse, and subtruncated at both extremities, granulated on the surface, and bearing the respiratory orifice nearer the centre than it is placed in *Sowerbii*. The colour of the shield is often darker than that of the body. The back is strongly and sharply carinated; its surface is covered with oblong tubercular wrinkles, each of which is depressed and granulated; they become smoother and larger towards the sides. The margin of the foot is smooth and, as well as the sole, white. The mucus is colourless. The shell is small in proportion to the bulk of the shield, unguiform, elongated, oval, thick, and irregularly convex, and as if crystalline beneath. The eggs are transparent and perfectly globular.

This scarce species differs from *Sowerbii* not only in colour, and the points already noted, but also in relative proportion of shield and body, the former being much larger in *gagates.* The description and figures of Draparnaud agree too well with the specimens we have examined to admit of a doubt of the correctness of the identification. It was first noticed as an inhabitant of the British Isles by the Rev. B. J. Clarke, who found it in several localities in Ireland. Dr. Robert Ball found it near Dublin, whence living examples were kindly transmitted to us by Mr. Kelly. Mr. W. Thompson, Dr. Ball, and Prof. E. Forbes found it near Clifden, in Connemara. We have taken it under stones in the open country near Castle Martyr in Ireland, and in similar places at Peel Castle in the Isle of Man (E. F.). The first and only example as yet met with in England was found by Mr. Darbyshire under a stone at the foot of a thorn hedge in Portland Island, in September, 1851. This specimen is a very dark variety, and has that jetty hue on the back, which induced Draparnaud to name the species as he did.

TESTACELLIDÆ.

TESTACELLA. Cuvier.

Animal elongated, semicylindrical; disk covering, and combined with the entire upper surface of the body, which bears an external, auriform, compressed shell, with a minute spire, at the hinder extremity of the back. Head with four tentacula, the upper ones bearing the eyes. Pulmonary orifice under the right side of the shell, the vent very near it. Reproductive orifice behind, and near the right superior tentacle.

We regard this genus as the type of a family intermediate between the slugs and the snails. The *Testacellæ* are subterranean in their habits, approaching the surface of the ground, or crawling upon it in autumn, and descending to a depth of one or two feet below the soil in winter. They are carnivorous, devouring worms and slugs.

T. haliotoidea, Draparnaud.

Plate G. G. G. fig. 1.

Testacella haliotidea, Draparn. Moll. Terr. et Fluv. France, p. 130, pl. 59, f. 17; 121 (in part), pl. 8, f. 44, 45; and Animal, pl. 9, f. 12, 13. — Fleming, Brit. Anim. p. 257. — Brown, Illust. Conch. G. B. p. 54, pl. 18, f. 15, 16.—Cuvier, Ann. du Mus. vol. v. pl. 35, f. 4. — Sowerby, Conch. Manual, f. 261.

Testacellus Europæus, Montfort, Conch. Syst. vol. ii. p. 95.

Testacellus haliotideus, Ferus. Hist. Moll. pl. 8, f. 5 to 9. — Turton, Manual L. and F. W. Shells, p. 29, f. 20. — Gray, Manual L. and F. W. Shells, p. 124, pl. 3, f. 19, 20.— Thompson, Ann. Nat. Hist. vol. vi. p. 19. — Sowerby, Genera Shells, Testacellus, f. 1, 2. — Cuvier, Animal Kingd. (ed. Griffith) Mollusc. pl. 35, f. 4. — Reeve, Conch. Systemat. vol. ii. pl. 161, f. 1, 2.

Testacella scutulum, Sowerby, Genera Shells, Testac. f. 3 to 6. — Turton, Manual L. and F. W. Shells, p. 28, f. 19.—J. D. Mag. Nat. Hist. vol. vii. p. 229, f. 41, d. e. — Reeve, Conch. Syst. pl. 161, f. 3 to 6.

„ Lukis, Mag. Nat. Hist. vol. vii. p. 224, f. 39.

„ *haliotoides*, Cantraine, Mem. Acad. Brux. vol. xiii. p. 97.

This animal is elongated, granulated above, grooved along the right side, of a general yellowish, tawny, or reddish hue, sometimes grey. The upper tentacles are rather long, the head small, the body increasing in bulk posteriorly, the tail steep and abrupt, and the foot marginated.

The shell, which is tolerably strong for its size (its length rarely, if ever, exceeds the third of an inch), is of a subauriform shape, but ranges from rounded oval to subtruncated oval; it is flattened and covered with a brownish ash-coloured epidermis nearly smooth, or at most, concentrically subrugose; the vertex is acute, prominent, and subspiral; the pillar, which is very broadly dilated, and somewhat twisted above, contracts rapidly below. The aperture is bluish white, and decidedly broader above than below; its external margin at first slopes very slightly outwards in a nearly straight line, and then forming a rather obtuse angle, inclines inwards with a gentle arcuation: the angle is very evidently below the level of the vertex.

This is peculiarly a southern species. It occurs in the Channel Isles, where it was first noticed by Mr. Lukis. Mr. Sowerby found it in a garden at Lambeth, and it has since been observed in several localities south and west of London, especially in Devon. It occurs also in the south of Ireland, where it was taken by Dr. Ball at Youghal, and by Professor Allman at Bandon.

SPURIOUS.

T. Maugei, Ferussac.

Testacellus Maugei, Ferus. Hist. Moll. pl. 8, f. 10, 12.—Miller, Ann. Philos. new ser. vol. iii. (1822), p. 380.—Fleming, Brit. Anim. p. 257. — Turton, Manual L. and F. W. Shells, p. 27, f. 18.—J. D. Mag. Nat. Hist. vol. vii. p. 229, fig. 41, f. 9 (from Ferus.). — Gray, Manual L. and F. W. Shells, p. 5, pl. 3. f. 18 (as spurious).—Sowerby, Genera Shells, Testac. f. 7 to 10.—Reeve, Conch. Syst. vol. ii. pl. 161, f. 7 to 10.

A native of Teneriffe, &c.; introduced by Miller, who found it in Nursery Gardens near Bristol.

HELICIDÆ.

The snails are provided with spiral, often turreted, rarely depressed, or expanded shells, which, however, is never operculated. In the deficiency of operculum the animal, when hybernating, closes the orifice with a membranous epiphragm, perforated for the admission of air. The head is well developed and furnished with retractile tentacula, the two upper ones always prominent and bearing the eyes at their extremities. These tentacles are always cylindrical.

The British *Helicidæ* and other tribes of our testaceous pulmonifera have formed the subjects of so many essays and monographs that we do not deem it necessary to treat of them at the same length, or to enter into details of their habits to the same extent that we have done in our account of marine mollusca, in order to keep our work within proposed limits, already considerably exceeded.

VITRINA. Draparnaud.

Shell thin, translucent, oblong or suborbicular, of few whorls, the last ample, the spire depressed; aperture rounded or oblong, large, lunate, entire; peristome thin; columella imperforate.

Animal bulky, large for the shell, lanceolate; head with four tentacula, the lower pair short; mantle ample, thick, reflected upon the shell, furnished with a lobe on the right side under the spire; tail obliquely truncated; edge teeth of tongue aculeate.

V. PELLUCIDA, Müller.

Plate CXXXI. fig. 8, 9, 10, and (Animal) Plate I. I. I. fig. 2.

Helix pellucida, MÜLLER, Verm. vol. ii. p. 15.—PENN. Brit. Zool. ed. 4, vol. iv. p. 138?—SHEPARD, Trans. Linn. Soc. vol. xiv. p. 169, animal.
Vitrina „ DRAPAR. Tabl. Moll. p. 98; Hist. Moll. Terr. et Fluv. France, p. 119, pl. 8, f. 34 to 37.—FLEMING, Brit. Anim. p. 267.—TURTON, Manual L. and F. W. Shells, p. 31 (ed. Gray, p. 120), f. 21.—ALDER, Mag. Z. and B. vol. ii. p. 105.—MACGIL. Moll. Aberd. p. 94.—BROWN, Illust. Conch. G. B. p. 54, pl. 17. f. 6, 7, 12.—BRARD, Coq. Envir. Paris, p. 78, pl. 3, f. 3 to 6.—LAM. Anim. s. Vert. (ed. Desh.) vol. vii. p. 728.—GUÉRIN, Iconog. R. A. Moll. pl. 5, f. 3.—DESH. Enc. Méth. Vers, vol. iii. p. 1133.
Helix diaphana, POIRET (not Drap. Tabl.), Coq. Fl. et Terr. Aisne, p. 77.
Helicolimax major, FERUS. Essai, p. 43.
Helix elliptica, BROWN, Mem. Werner. Soc. vol. ii. pt. 2, p. 525, pl. 24, f. 8 (read in 1815).
„ *Draparnaldi*, CUVIER, Règne Anim. vol. ii. p. 405.
Vitrina major, C. PFEIF. Land und Süssw. Moll. pt. 1, p. 47, note.
Limacina pellucida, *var. β*, HARTM. Neue Alpina, vol. i. p. 246.
Helicolimax Audebardi, FERUS. Tabl. Syst. Moll. p. 21; Hist. Moll. pl. 9, f. 5.
„ *pellucida*, BLAINV. Dict. Sc. Nat. vol. xxxii. p. 255.
Vitrina Audebardi, C. PFEIF. Land und Süsswas. Moll. pt. 3, p. 55.
„ *Draparnaldi*, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 326.—L. PFEIF. Monog. Helic. vol. ii. p. 493.
„ *Mülleri*, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 326.
„ *Dillwynii*, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 506 (changed from *elongata*, p. 327).

Shell small, transversely elliptic, oblique, extremely thin and transparent, very highly polished, ranging in colour from oil-yellow to pea-green (in the latter case less diaphanous, and lined internally with subnacreous white), quite smooth, except near the distinctly impressed suture which is margined by a threadlike indentation, and crenated, though at times obscurely so. Shape of the disks, or upper and lower surfaces, not circular, but semi-oval. Whorls three and a half, rapidly enlarging, simply and moderately convex; the spire scarcely elevated, ending obtusely. Body very large in proportion, filling about five-sixths of the length, rather broadly rounded at the periphery; the convex curvature of its surface more abruptly declining below than above. Mouth lunate-oval, rather broader than it is long, capacious, usually occupying two-thirds of the height, four-sevenths of the breadth, and almost half the central area. Outer lip very greatly projecting, simple, acute, arched, sloping down and leaning over above, subarcuated and vastly receding below. Pillar lip thin, slanting so as to form a continuous curve with the basal edge, very briefly reflected at the axis, but not forming a distinct perforation. Length an inch and three quarters; breadth three inches and a quarter.

In the broad yellow variety, the spire is pre-eminently depressed, and the mouth peculiarly ample; in the less pellucid pea-green variety the contrary conditions more frequently prevail.

The animal is usually only partially retractile, of a bluish grey colour, sometimes tinged with yellow; two pale violet lines run down the rather short upper tentacula and along the neck, but soon fade away. The lower tentacles are short and slightly violet. The mantle is reflected on the lip of the shell, and behind, beneath the spire, has a lobe-like process. The tail projects behind the shell, and is suddenly and obliquely truncated. This pretty little snail is common in all parts of the country, among moss, under stones, &c.

NOTE.—Turton having obtained a shell which he supposed to be the *Helix brevipes* of Draparnaud's "Mollusques," copied the figure (Manual L. and F. W.

Shells, f. 50, from Drap. pl. 8, f. 30, 31) and part of the description (p. 65), but subsequently (p. 142) referred his specimen to the young of *Vitrina.* His drawing of *V. elongata* (Manual, f. 22) is likewise derived from the same source (Drap. pl. 8, f. 41), the French species not being a native of this country.

ZONITES. GRAY.

Shell spiral, more or less subdiscoid; spire of many whorls, depressed, thin, polished; mouth lunate, entire, peristome thin; columella perforate.

Animal bulky, but not over-large in proportion to shell, lanceolate; head with four tentacles, the lower pair short; mantle thickened and slightly reflected; tail obliquely truncated; edge-teeth of tongue aculeate.

We adopt this genus, in the sense given to it by Mr. Gray, with a restriction, however, since we include in it only the hyaline species of that author. It forms a connecting link between *Vitrina* and *Helix*, but is more nearly allied to the former than to the latter. This has been proved by the observations of Mr. W. Thomson, on the dentition of those snails, to which the name *Zonites* has been applied. "From the very similar character of the edge-teeth in *Zonites alliarius*, *cellarius*, *nitidulus* and *radiatulus* (whose tongues greatly resemble each other)," writes Mr. Thomson, "I am induced to believe that they should come in between *Vitrina* and the true *Helices*, for while their edge-teeth show no appearance of bifurcation, the heel to the apex may possibly be looked upon as an approach towards it. Their sagittate central tubercle corresponds with that of *Vitrina*, and a similarly-shaped central tubercle in *Helix fulva* connects them with the true *Helices*, which have a simple aculeate tubercle. *Zonites radiatus* (so called) is a true *Helix*."*

---

* Annals Nat. Hist. 2nd ser. vol. vii. p. 91.

Z. cellarius, Müller.

Flat, transparent, and pale yellowish horn-colour above, opaque white beneath, very shining, nearly smooth; whorls five, or five and a half; umbilicus moderately large.

Plate CXX. fig. 1, 2, 3, and (Animal) Plate H. H. II., fig. 3.

Helix cellaria, Müller, Hist. Verm. pt. 2, p. 28. — Alder, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 37; Mag. Zool. and Bot. vol. ii. p. 108.—Brown, Illust. Conch. G. B. p. 51, pl. 17, f. 59, 60. —Lam. (ed. Desh.) vol. viii. p. 71.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 42, pl. 2, f. 39, 40. — Rossmässl. Iconog. Land und Süsswas. Moll. pt. 1, p. 70, f. 22; and pt. 8, p. 36, f. 527. — Krynicki, Bull. Soc. Nat. Moscou, vol. ix. p. 203.—Binney, Bost. Journ. of Nat. Hist. vol. iii. pl. 26, f. 2. —Gould, Invert. Massach. p. 180, f. 104. — Morelet, Moll. Terr. et Fluv. Portugal, p. 54. — Chemn. (ed. Küst.) Conch. Cab. Helix, No. 517, pl. 84, f. 8, 9, 10. — L. Pfeif. Monog. Helic. vol. i. p. 112.

„ *lucida*, Pult. Hutchins Dorset, p. 47 ?—Mont. Test. Brit. p. 425, pl. 23, f. 4 (not vars.). — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 340, —Turton, Manual L. and F. W. Shells, f. 40.

„ *nitida*, Drapar. Moll. Terr. et Fluv. France, p. 117, pl. 8, f. 23 to 25.— Fleming, Brit. Anim. p. 262 (not note).

„ *nitens*, Maton and Rack. Trans. Linn. Soc. vol. viii. p. 198, pl. 5, f. 7.— Rack. Dorset Catal. p. 54, pl. 19, f. 22, in part. — Turton, Conch. Diction. p. 52; Manual L. and F. W. Shells, p. 55.— Alten, Erd und Flüsskonch. Augsburg, p. 58, pl. 5, f. 10.

Oxychilus cellaria, Fitzing. Syst. Derz. Erzh. Weichth. p. 100.

Polita „ Held, Isis, 1837, p. 916.

Helicella cellaria and *Draparnaudii*, Beck, Index Moll. Mus. Christ. Frid. p. 6.

Zonites cellarius, Gray, Manual L. and F. W. Shells, p. 170, pl. 4, f. 40.— Macgil. Moll. Aberd. p. 88.

Shell depressed, flattish, somewhat pellucid, glossy, but not polished, pale horn-colour with sometimes a light greenish tint, passing into opaque white on the under surface, almost smooth yet with indistinct longitudinal striulæ near the sutures. Whorls five or five and a half, flattened yet deeply defined, enlarging gradually yet not slowly. Spire scarcely raised, apex blunt. Aperture obliquely crescent-shaped, manifestly descending at its base, below the general levels of the disk, not quite so high as broad, equal in width to nearly half the total diameter. Peristome thin, simple, not reflected. Base not much rounded, more distinctly wrinkled than the upper surface; umbilicus moderately large, exposing the second whorl. Diameter two-fifths of an inch.

Although Müller describes the animal as "Limax totus albus," that is not the usual appearance of it, especially when taken in the fields. It is of a bluish-white hue with dark violet head, neck, and tentacles. The upper tentacles are long and slender, and bear the eyes within a pale space at their swollen tips. The foot is marginated. The tail slightly exceeds the shell and is gently truncated obliquely at its extremity.

This species is universal through the British Isles, living in houses, under stones, in drains, and among grass.

Z. ALLIARIUS, Miller.

Resembling *cellaria*, but much smaller, more convex, of only four volutions, not so pallid, merely opaque white near the umbilicus.

Plate CXX. fig. 5, 6.

Helix alliaria, MILLER, Ann. Philos. new ser. vol. iii. p. 379. — ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 37;—Mag. Zool. and Bot. vol. ii. p. 108. — TURTON, L. and F. W. Shells, p. 56, f. 39, (very badly).—BROWN, Illust. Conch. G. B. p. 52.—CHEMN. (ed. Küst.) Helix, No. 508, pl. 83, f. 10, 11, 12.—L. PFEIF. Monog. Helig. vol. i. p. 90.

„ *glabra*, STUDER in Ferus. Prodrom. Moll. 215.—CHARPENT. N. Denksch. Schweiz. Ges. Nat. vol. i. (1837), p. 13, pl. 1, f. 22 (Hyalinia). —ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 8, p. 36, f. 528.

„ *alliacea*, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 341.

Helix nitens, SHEPPARD, Trans. Linn. Soc. vol. xiv. p. 160.
„ *fœtida*, STARK, Elem. Nat. Hist. vol. ii. p. 59.
„ *lurida*, STUDER, Verz. Schweiz. Conch. (not synon.) fide Charp.
? „ *tenera*, HARTM. Neue Alpina, vol. i. p. 232.
Polita glabra, HELD, in Isis, 1837, p. 619.
Helicella „ BECK, Index Moll. Mus. Christ. Frid. p. 6.
„ *alliaria*, BECK, Index Moll. Mus. Christ. Frid. p. 7.
Zonites alliarius, GRAY, Manual L. and F. W. Shells, p. 168, pl. 4, f. 39.—MACGIL. Moll. Aberd. p. 91.

Shell rather small, convex yet depressed, highly polished, thin, transparent, clear yellowish, or yellowish horn-colour, changing into rather opaque white towards the middle of the lower disk, almost smooth, or only faintly striated. Spire very little raised. Volutions four, not convex but deeply defined, not rapidly enlarging; the last broad, flattened, and not bending much forward. Aperture not very oblique, crescent-shaped, rather broader than high, about equal in width to half the total diameter. Peristome thin, simple, not reflected. Base rounded at the sides, umbilicus deep.

Diameter about a quarter of an inch. It is smaller and more convex than *cellaria*, with its aperture less obliquely inclined, and its basal opacity less manifest. Its bright clear and transparent colour distinguishes it from *nitidula*.

The animal resembles *cellaria* and the rest of this section in shape, but differs in colour, being of a general deep violet or black hue, paler only on the sole. It is remarkable for secreting a mucus that gives out a pungent odour of garlic. It is universally diffused through the British Isles, living in very various localities, common in gardens and greenhouses, and frequent under stones on sandy dunes. It is found also at a considerable elevation on mountains, living under stones even upon their summits.

Z. NITIDULUS, Draparnaud.

Depressed, not highly polished, dull waxen yellow above, partially opaque white beneath, smooth; umbilicus decidedly large.

Plate CXX. fig. 8, 9, 10.

Helix nitidula, DRAPAR. Moll. Terr. et Fluv. France, p. 117.—GRAY, Medical Repository, 1821, p. 239. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 340, not var. — ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 38.—BROWN, Illust. Conch. G. B. p. 52. —FERUS. Prodrom. Moll. p. 213 (Helicella). — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 72, f. 24; and pt. 8, p. 26, f. 526. — KRYNICKI, Bull. Soc. Nat. Moscou, vol. ix. p. 208. — CHEMN. (ed. Küst.) Helix, No. 512, pl. 83, f. 20, 21, 22.—L. PFEIF. Monog. Helic. vol. i. p. 93.
Oxychilus nitidulus, FITZING. Syst. Verz. Erzh. Weichth. p. 100.
Polita nitidula, HELD, Isis, 1837, p. 216.
Helicella „ BECK, Index Moll. Mus. Christ. Frid. p. 6.
Zonites nitidulus, GRAY, Manual L. and F. W. Shells, p. 172, pl. 12, f. 136.—MACGIL. Moll. Aberd. p. 89.

Shell not very large, depressed, more convex above than below, not lustrous but with a slight resinous gloss of an uniform dull brownish amber or wax-colour above, becoming paler below and changing into opaque white underneath towards the mouth and umbilicus, obscurely substriolated lengthways, otherwise smooth. Spire very little raised, apex obtuse. Whorls four and a half to five, a little rounded, rather broad, not abruptly enlarging; the last rather wide but not depressed, rather bending downwards towards the aperture. Mouth obliquely crescent-shaped, broader than high, not equal in width to half the total diameter, very considerably projecting beyond the penult whorl. Peristome thin, simple, not reflected. Base not much rounded, concave centrally, umbilicus rather large, profound.

Diameter about three-eighths of an inch.

The animal is, according to Mr. Alder, of a dark lead-colour, darker than *cellarius*. It is not so common, but is probably much more widely distributed than usually supposed. It inhabits shady places, under stones.

Z. PURUS, Alder.

Small, depressed, smooth, whitish and transparent both above and below; body whorl decidedly broader than the preceding turn; outer lip acute; umbilicus rather large.

Plate CXXI. fig. 5, 6.

Helix nitidula, var. DRAPAR. Moll. Terr. et Fluv. France, p. 117, pl. 8, f. 21, 22. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 340, 511. —C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 45, pl. 2, f. 35.

„ *nitidosa*, FERUS. Prodrom. Moll. No. 214 (no descr.) — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 71, pl. 1, f. 23.— KRYNICKI, Bull. Soc. Nat. Moscou, vol. ix. p. 205.

„ *crystallina*, FLEMING, Brit. Anim. p. 262 ?

„ *pura*, ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 37; Mag. Zool. and Bot. vol. ii. p. 108.—TURTON, Manual L. and F. W. Shells, p. 59, f. 43 (badly magnified). — THOMPSON, Ann. Nat. Hist. vol. vi. p. 32. — BROWN, Illust. Conch. G. B. p. 53. — CHEMN. (ed. Küst.) Conch. Cab. Helix, No. 511, pl. 83, f. 17 to 19.— L. PFEIF. Monog. Helic. vol. i. p. 96 (not var. β).

„ *viridula*, MENKE, Synops. Moll. ed. 2, p. 127.

„ *lenticula*, HELD, Isis, 1837, p. 304.

Polita nitidosa, HELD, Isis, 1837, p. 916.

Helicella „ BECK, Index Moll. Mus. Christ. Frid. p. 6.

Helix electrina, GOULD, Bost. Journ. of Nat. Hist. vol. iii. p. 423, pl. 22, f. 2.— Invert. Massach. p. 183, f. 111.

Zonites purus, GRAY, Manual L. and F. W. Shells, p. 171, pl. 4, f. 43.—MACGIL. Moll. Aberd. p. 92 (probably).

Shell small, depressed, transparent, moderately shining, thin, white or occasionally very pale horn coloured, of an uniform tint, not becoming opaque underneath, almost smooth, or at most obscurely wrinkled by the lines of increase. Spire very little raised; apex blunt. Whorls three and a half to four, moderately broad, gradually but not abruptly enlarging, but little convex, somewhat oblique, well defined, the last shelving. Aperture very oblique, rounded, crescent-shaped, broader than high, nearly as wide as half the total diameter. Peristome thin, simple, not reflected. Base a little flattened, umbilicus deep, rather large. Diameter about the fifth or the sixth of an inch.

The animal is white with two black cervical lines. It varies in being darker. The cloak is white speckled with black (Alder). It is most frequent in woods in the north of England, where it was first noticed by Mr. Alder in the neighbourhood of Newcastle.

Z. RADIATULUS, Alder.

Very small, depressed, shining, of a transparent, pale amber colour, rarely white, on both disks, regularly striated; whorls at most four, flattened at their junction with the inner ones; body whorl decidedly broader than the preceding turn; umbilicus moderately large.

Plate CXXI. fig. 1.

Helix radiatula, ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 38; and vol. ii. p. 340.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 511. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 35. — BROWN, Illust. Conch. G. B. p. 53.
Zonites radiatulus, GRAY, Manual L. and F. W. Shells, p. 173, pl. 12, f. 137.— MACGIL. Moll. Aberd. p. 91.
Helix pura, var. β. PFEIF. Monog. Helic. vol. i. p. 96.

Small, depressed, thin, transparent, shining, of an uniform brownish amber-colour or fulvous horn-colour (rarely pure white), not becoming white or opaque underneath, with regular sharply cut longitudinal striæ upon the superior disk, which are much arcuated, numerous but not crowded, and obsolete upon the base. Spire much depressed, apex blunt. Whorls three and a half to four, moderately broad, decidedly but not abruptly enlarging, distinctly defined, peculiarly though slightly flattened near their upper suture, moderately convex below. Aperture very oblique, rounded crescent-shaped, manifestly broader than high, nearly equal in width to half the total diameter, its lower portion far below the general level of the base. Peristome thin, simple, not reflected. Circumference well rounded. Base a little flattened ; umbilicus rather large at the commencement but much contracted by the penult whorl. Diameter about the sixth of an inch.

The animal, according to Alder, is black. This species occurs among moss in woods and under stones. It is most frequent in the north and east of England, but has a very general distribution and is common in all provinces of Ireland and Scotland.

Z. NITIDUS, Müller.

Depressed, much shining, transparent and brownish fulvous on both disks ; whorls four and a half to five, of moderate enlargement ; suture profound, umbilicus large.

Plate CXX. fig. 4, 7.

? *Helix Hammonis*, STRÖM. Acta Nidross. vol. iii. p. 435, pl. 6, f. 16.

„ *nitida*, MÜLLER, Hist. Verm. pt. 2, p. 32.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 339. — LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 72. — CHEMN. (ed. Küst.) Conch. Cab. Helix, No. 108, pl. 24, f. 30, 31.—L. PFEIF. Monog. Helic. vol. i. p. 94.

„ *nitens*, GMELIN, Syst. Naturæ, p. 3633.

„ *lucida*, DRAPAR. Moll. Terr. et Fluv. France, p. 103, pl. 8, f. 11, 12.—GRAY, Medical Repository, 1821.—ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 38.—TURTON, Manual L. and F. W. Shells, p. 56, f. 38. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 33.—BROWN, Illust. Conch. G. B. p. 52.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 35, pl. 2, f. 19.—ROSSMÄSSL.

Iconog. Land und Süsswas. Moll. pt. 1, p. 72, pl. 1, f. 25.—Krynicki, Bull. Soc. Nat. Moscou, vol. ix. p. 207. — Charpent. N. Denks. Schweiz Ges. Nat. vol. i. (1837) p. 13.
? *Helix tenuis*, Dillw. Recent Shells, vol. ii. p. 913.
,, *succinea*, Studer, in Coxe Trav. (Hartm.)
Oxychilus lucidus, Fitzing. Syst. Verz. Erzh. Weichth. p. 100.
Tanychlamys lucida, Benson, Proc. Zool. Soc. 1834, p. 89.
Polita ,, Held, Isis, 1837, p. 916.
Helicella nitida and *succinea* ? Beck, Index Moll. Mus. Christ. Frid. p. 6.
Zonites lucidus, Gray, Manual L. and F. W. Shells, p. 174, pl. 4, f. 38.—Macgil. Moll. Aberd. p. 90.

Shell rather small, rather depressed, thin, transparent, glossy, of an uniform brownish fulvous hue, not exhibiting any trace of opacity on the lower disk, longitudinally striolate, spire a little raised, rather obtuse at the apex. Whorls four and a half or five, gradually and not abruptly enlarging, moderately convex, well defined ; the last broadly rounded and not contracted at the circumference. Aperture roundish crescent-shaped, rather broader than high, not quite equal to half the total diameter. Peristome thin, simple, not reflected, basal edge arcuated, base somewhat rounded, a little produced anteriorly, umbilicus decidedly large, displaying the second volution, diameter rather above a quarter of an inch.

The animal is dark. This snail is not uncommon under stones in shady places.

Z. excavatus, Bean.

Small, transparent and fulvous above and below, much shining, regularly striated ; whorls very slowly enlarging, so that the body is scarcely broader than the preceding turn ; umbilicus peculiarly capacious.

Plate CXXI. fig. 2, 3, 4.

Helix excavata, Bean, in Alder's Catalog. L. and F. W. Shells (Trans. Nat. Hist. Soc. Northumb. vol. i. p. 38). — Alder, Mag. Zool. and Bot. vol. ii. p. 107.—Thompson, Ann. Nat. Hist. vol. vi.

p. 34.—BROWN, Illust. Conch. G. B. p. 53, pl. 18*, f. 9, 10. —L. PFEIF. Monog. Helic. vol. i. p. 98.
Helix nitida, var. a, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 339, 511.
„ *lucida, var.* ? TURTON, Manual L. and F. W. Shells, p. 57.
Zonites excavatus, GRAY, Manual L. and F. W. Shells, p. 175, pl. 12, f. 138.

Shell small, rather depressed, sub-orbicular, thin, transparent, polished, of an uniform fulvous yellow, or yellowish horn colour, not opaque beneath, with distinct longitudinal striæ or wrinkles, spire a little raised, apex blunt. Whorls five, moderately convex, or even slightly rounded, well defined, very slowly enlarging; the last scarcely exceeding the penult, but little descending, and more shelving below than above. Aperture rather small, rounded, crescent-shaped, scarcely broader than high, in width not more than equal to two-fifths the total diameter. Peristome thin, simple, not reflected, base well rounded, umbilicus very large, displaying all the superior volutions.

Diameter scarcely a quarter of an inch.

The animal is lead-coloured (Alder). In Yorkshire, Northumberland, Durham, and other counties in the North of England and South of Scotland, are its favourite localities. It has been taken near Cork in Ireland by Miss King, and at Clifden in Galway (W. Thompson). As yet it has not been noticed out of Britain.

Z. CRYSTALLINUS, Müller.

Minute, nearly flat, shining, white, transparent; body scarcely broader than the preceding turn; mouth lunate; umbilicus small.

Plate CXXII. fig. 1, 2.

Helix crystallina, MÜLLER (not Fleming), Hist. Verm. pt. 2, p. 23. — GRAY, Medical Repository, 1821, p. 239.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 341. — ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 36. — TURTON, Manual L. and F. W.

Shells, p. 58, f. 42. — Brown, Illust. Conch. G. B. p. 53, pl. 18*, f. 7.—Drapar. Moll. Terr. et Fluv. France, p. 118, pl. 8, f. 13 to 20.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 46, pl. 2, f. 36. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. (1837), p. 13 (Hyalinia). — Rossmässl. Iconog. Land und Süssw. Moll. pt. 8, p. 37, f. 531. — Morelet, Moll. Terr. et Fluv. Portugal, p. 55.— Chemn. (ed. Küst.) Conch. Cab. Helix, No. 555, pl. 88, f. 27 to 30.—L. Pfeif. Monog. Helic. vol. i. p. 59.

Helix eburnea, Hartm. Neue Alpina, vol. i. p. 234.

„ *cristallina*, Ferus. Prodrom. Moll. No. 223 (Helicella). — Miller, Ann. Philos. new ser. vol. iii. (1822), p. 379. — Lam. (ed. Desh.) vol. viii. p. 87.

„ *vitrea*, Brown, Edinb. Journ. Nat. and Geogr. Sc. vol. i. pl. 1, f. 12, 13, 14.—Isis, 1832, p. 11.

Discus crystallinus, Fitzing. Syst. Verz. Erzh. Weichth. p. 99.

Polita crystallina, Held, Isis, 1837, p. 916.

Helicella „ Beck, Index Moll. Mus. Christ. Frid. p. 7.

Zonites crystallinus, Gray, Manual L. and F. W. Shells, p. 176, pl. 4, f. 42.— Macgil. Moll. Aberd. p. 92.

Shell very small, orbicular, flattened, thin, of an uniform pellucid white, with a slight tinge of green, polished, smooth, or very slightly striated, not opaque beneath. Spire scarcely raised, apex obtuse. Whorls five, defined, yet scarcely convex, very narrow, enlarging very gradually; the last but inconsiderably broader than the penult, and not shelving above, so that the circumference is broadly rounded. Aperture nearly as high as it is broad, obliquely crescent-shaped, not quite equal in width to half the total diameter, produced beneath the basal level. Peristome acute, simple, not reflected. Base convex, umbilicus small, profound. Diameter not much exceeding the eighth of an inch.

The animal is white, with fine dark lines running along the neck and tentacula. This pretty little snail is widely distributed in all parts of Britain; but owing to its minuteness is apt to be overlooked: it should be sought for in damp places, under stones and among moss.

HELIX. Linnæus.

Shell spiral, opaque, or translucent, solid or thin, more or less globose, in some discoid, smooth, or sculptured, surface variously coloured, but seldom covered with a polished epidermis. Mouth lunated, thickened within, simple or toothed, peristome frequently reflexed.

Animal moderately large in proportion to shell, head with four developed tentacles, mantle not reflected on shell; tail lanceolate and never truncate; foot often ample; tongue with the edge-teeth serrated.

H. aperta, Born.

Subglobose, wrinkled lengthways, uniform brownish-green: mouth extremely large.

Plate CXVI. fig. 7.

Gault. pl. 1, f. .

Helix terrestris, Forskael (teste Beck), Desc. Anim. It. Orient.

„ *aperta*, Born, Mus. Cæs. Vind. p. 387, pl. 19, f. 20.—Gray, Manual L. and F. W. Shells, p. 127, pl. 11, f. 129.—Chemn. (ed. Küst.) Conch. Cab. vol. vii. Helix, No. 1, pl. 1, f. 1 to 4. — L. Pfeif. Monog. Helic. vol. i. p. 25.

„ *Neritoides*, Chemn. Conch. Cab. vol. ix. pt. 2, p. 150, pl. 133, f. 1204, 1205.

„ *Naticoides*, Drapar. Moll. Terr. et Fluv. France, p. 92, pl. 5, f. 26, 27.—Ferus. Prodrom. Moll. No. 15; Hist. Moll. Terr. et Fluv. pl. 11, f. 17 to 20. — Lam. (ed. Desh.) vol. viii. p. 35. — Blainv. Man. Malacol. p. 460, pl. 40, f. 6. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 5, p. 1, f. 285 (pt. 2, f. 156, animal).—Küster, in Chemn. Conch. (ed. 2), p. 24.

Cantareus „ Risso, Hist. Nat. l'Europe Mér. vol. iv. p. 64.

Cænatoria „ Held, Isis, 1837, p. 910.

Pomatia aperta, Beck, Index Moll. Mus. Christ. Frid. p. 44.

Shell rather large, imperforate, globular, or ovate-globose, inflated, very thin, not distinctly pellucid, with irregular longitudinal fold-like striæ, which are, sometimes, partially confluent, or connected by short branches, clothed with a closely adherent, and more or less shining epidermis of a yellowish olive colour. Spire very short; body extremely large; apex blunt. Whorls four moderately rounded, rapidly enlarging; the last not distinctly deflected. Aperture higher than broad, obovate, equal in width to two-thirds the total diameter of the shell, rather suddenly contracted above by the arcuation of the penult whorl. Peristome thin, simple, not reflected, slightly edged with white, much arcuated below, its dilation upon the produced pillar very slight; a rather obscure shelly coating connecting the two lips in the adult.

The animal is very large for the shell; its colour is brownish grey with dusky tentacula.

A large foreign example measured an inch and an eighth in length, and an inch and a fifth in breadth. It finds a place in the "British Fauna" on account of a specimen found in Guernsey, in 1839, by Professor E. Forbes, and deposited in the British Museum. It is common in the south of France.

H. ASPERSA, Müller.

Obliquely subglobose, beneath the epidermis pale fawn-coloured, with four (usually interrupted) chocolate-brown bands.

Plate CXVI. fig. 1.

KNORR, Délices des Yeux, pt. 4, pl. 27, f. 3.
Helix grisea, LINN. Syst. Nat. ed. 12, p. 1247 (badly described).—GMELIN, Syst. Nat. p. 3649.—BRUMATI, Conch. Monfalcone, p. 24.
,, *aspersa*, MÜLLER, Hist. Verm. pt. 2, p. 59.—MONT. Test. Brit. p. 407.—FLEMING, Brit. Anim. p. 263.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 328.—TURTON, Manual L. and F. W. Shells, p. 52,

f. 35.—Gray, Manual L. and F. W. Shells, p. 128, pl. 5, f. 35, —Thompson, Ann. Nat. Hist. vol. vi. p. 20. — Macgil. Moll. Aberd. p. 80. — Brown, Illust. Conch. G. B. p. 43, pl. 16, f. 5, 13, 17, 18.—Chemn. Conch. Cab. vol. ix. pl. 130, f. 1156, 1157, 1138 b. — Ferus. Prodrom. Moll. No. 51 ; Hist. Moll. Terr. et Fluv. pl. 18, 24, f. 3.—Lam. (ed. Desh.) Anim. s. Vert. vol. viii. p. 32.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 55, f. 3; and pt. 5, p. 5, f. 294. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. p. 6.—Morelet, Moll. Terr. et Fluv. Portugal, p. 67. — Chemn. (ed. Küst.) Conch. Cab. Helix, No. 9, pl. 3. f. 6, 7.—L. Pfeif. Monog. Helic. vol. i. p. 241.

Helix hortensis, Pennant, Brit. Zool. ed. 4, vol. iv. p. 136, pl. 84, f. 129. — Donov. Brit. Shells, vol. iv. pl. 131. — Maton and Rack. Trans. Linn. Soc. vol. viii.

„ *variegata*, Gmelin, Syst. Nat p. 3650.

Cœnatoria aspersa, Held, Isis, 1837, p. 910.

Cochlea vulgaris, Dorset Catalog. p. 55, pl. 20, f. 1. — Turton, Conch. Diction. p. 80.—Index Testaceolog. pl. 34, f. 126. — Da Costa, Brit. Conch. p. 72, pl. 4, f. 1.

Helix lucorum (not of authors), Pulteney, Hutchins, Hist. Dorset. App. p. 48.

Pomatia adspersa, Beck, Index Moll. Mus. Christ. Frid. p. 44 (no descr.).

(Monstrosities), Born, Mus. Cæs. Vind. pl. 13, f. 10, 11.—Chemn. Conch. Cab. vol. xi. pl. 211, f. 2092, 2093. — Ferus. Hist. Nat. Moll. Terr. et Fluv. pl. 19, f. 1, 2.

Shell imperforate, obliquely conoid-globose, thin, subopaque, or semi-transparent, covered with small indentations, clothed with a yellowish olivaceous epidermis, beneath which the surface is whitish, or pale fawn-coloured ; adorned with chocolate-brown bands, that are sometimes confluent, sometimes obsolete ; of these there are usually three on the penult whorl, and four on the body, which are interrupted by wavy linear whitish or pale-coloured streaks ; more rarely the shell is pale yellow, and very slightly banded. Spire strongly wrinkled lengthways, short, conoid, about one-third to one-fourth the height of the body ; suture oblique ; apex blunt. Volutions four to four and a half, moderately convex, rapidly enlarging, the last swollen, and abruptly deflected. Aperture nearly ovate ; very slightly lunate, as high as, or higher than, broad, about half as wide as the total diameter; peristome white, thin, expanded, slightly reflected, much dilated upon the pillar, which is oblique and only slightly arcuated. Diameter nearly an inch and a half. Scalariform and sinistral varieties are sometimes met with.

The animal is roughly granulated, of a general greenish grey, mottled with minute white or yellow opaque specks, darker about the head and neck, and there striped with a pale band.

This handsome but commonest of snails is found universally throughout the British Islands, and owing to its being an article of food in some countries, or else a supposed remedy for pulmonary affections, has been transported and distributed by the agency of man to all parts of the world. It is especially abundant in the neighbourhood of gardens.

H. POMATIA, Linnæus.

Solid, globose, coarsely wrinkled lengthways, most minutely striated in a spiral direction, pale tawny, with rufous bands.

Plate CXVI. fig. 2.

LISTER, Hist. Conch. pl. 48, f. 46.

Helix pomatia, LINN. Syst. Nat. ed. 12, p. 1244.—PENNANT, Brit. Zool. ed. 4, vol. iv. p. 134, pl. 84, f. 128. — PULTENEY, Hutchins, Hist. Dorset, p. 47.—DONOV. Brit. Shells, vol. iii. pl. 84.—MONT. Test. Brit. p. 405. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 201. — Dorset Catalog. p. 54, pl. 20, f. 14. — TURTON, Conch. Diction. p. 54. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 329, 506.—FLEMING, Brit. Anim. p. 259.—TURTON, Manual L. and F. W. Shells, p. 44, f. 34.—GRAY, Manual L. and F. W. Shells, p. 135, pl. 4, f. 34. — BROWN, Illust. Conch. G. B. p. 43, pl. 16, f. 6, 12, 14. — CHEMN. Conch. Cab. vol. ix. f. 1138 a.—STURM. Deutsch. Fauna, section 6, pt. 1, pl. 13, 14.—DRAPAR. Moll. Terr. et Fluv. p. 87, pl. 5, f. 20. — FERUS. Prodrom. Moll. No. 31; Hist. Nat.

pl. 21, f. 1 to 5; pl. 24, f. 2. — LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 31. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 4, p. 25, pl. 2, f. 9.—ROSSMÄSSL. Iconog. Land und Sussw. Moll. pt. 1, p. 54, f. 1, 2, 79. — SOWERBY, Conch. Man. f. 268. — CHEMN. (ed. Küst.) Helix, pl. 5, f. 5, 6. — L. PFEIF. Monog. Helic. vol. i. p. 234.

Cochlea pomatia DA COSTA, Brit. Conch. p. 67, pl. 4, f. 14.

Cœnatoria „ HELD, Isis, 1837, p. 910.

Helicogena „ HARTM. Erd und Süssw. Gast. pt. 1, p. 98, pl. 29, 30, 35.

(Monstrosities), MÜLLER, Verm. pt. 2, p. 113 (H. pomaria and H. scalaris).—BORN, Mus. Cæs. Vind. pl. 13, f. 21, 22.—CHEMN. Conch. f. 908, 909, 910, 1139.—DRAPAR. Moll. France, pl. 5, f. 21, 22.—C. PFEIF. Deutsch. Moll. pt. 3, pl. 2, f. 1, 2, 3, 8, 9.—FERUS. Hist. Moll. pl. 21, f. 7, 8, 9.

Shell large, globose, solid, with coarse longitudinal wrinkles, and very minute and spiral striulæ, that are generally distinct on the upper turns, and obsolete below, whitish or pale tawny, with not clearly defined spiral rufous or tawny bands (usually three broadish and a narrower sutural zone upon the body-whorls, the two upper of which are visible upon the penult whorl). Spire rarely more than one-third the length of the body, which is of considerable magnitude; apex blunt. Volutions five, moderately convex; suture distinct, generally oblique. Aperture lunate-oval, or of a short and somewhat curved pear-shape, higher than broad, more than equal in width to half the total diameter, white except at the margin, where it is brownish or of a pale liver-colour; columella arcuated. Peristome thickened, dilated and callous upon the columella, so as to partially conceal the umbilicus; diameter nearly two inches.

The animal is of a general brownish-grey, speckled with whitish and brown granulations. This snail is pre-eminently termed "edible," not because it is better for cooking than its allies, but on account of its having been more sought after as food, its large size attracting the lovers of such dainties. There is a general belief, that it was introduced into England, where it is entirely confined to the southern counties, living chiefly upon cretaceous soils. It appears, however, to be a true native.

H. ARBUSTORUM, Linnæus.

Brown, closely marbled, with small linear paler markings, usually one-banded ; outer lip white and reflected.

Plate CXV. fig. 5, 6.

Helix arbustorum, LINN. Syst. Nat. ed. 12, p. 1245. — PENNANT, Brit. Zool. ed. 4, vol. iv. p. 135, pl. 84, f. 130.—PULTENEY, Hutchins, Hist. Dorset, p. 47.—MONT. Test. Brit. p. 413.—DONOV. Brit. Shells, vol. iv. pl. 136. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 202. — Dorset Catalog. p. 54, pl. 2, f. 6.—TURTON, Conch. Diction. p. 56.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 329.—FLEMING, Brit. Anim. p. 264. — TURTON, Manual L. and F. W. Shells, p. 35, f. 25. — GRAY, Manual L. and F. W. Shells, p. 137, pl. 3, f. 25.— THOMPSON, Ann. Nat. Hist. vol. vi. p. 23. — MACGIL. Moll. Aberd. p. 81. — BROWN, Illust. Conch. G. B. p. 44, pl. 16, f. 16, 20, 21, 22. — DRAPAR. Moll. Terr. et Fluv. France, p. 88, pl. 5, f. 18.—C. PFEIF. Deutsch. und Land Süssw. Moll. pt. 1, p. 24, pl. 2, f. 7, 8.—FERUS. Prodrom. Moll. p. 40; Hist. Moll. Terr. et Fluv. pl. 27, f. 5 to 8; and pl. 39, B. f. 3 (animal). — LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 51. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 56, f. 4, 78 ; and pt. 5, p. 5, f. 297. —CHARPENT. N. Denks. Schweiz. Ges. Nat. vol. i. (1837), p. 5, pl. 1, f. 2.—PFEIF. Weigm. Archiv. Nat. 1841, pt. 1, p. 217.—CHEMN. (ed. Küst.) Conch. Cab. Helix, No. 323, pl. 57, f. 4 to 9.—L. PFEIF. Monog. Helic. vol. i. p. 339.

? ,, *Gothica*, LINN. Syst. Nat. ed. 10, p. 770.

Cochlea unifasciata, DA COSTA, Brit. Conch. p. 75, pl. 17, f. 6.

Helix Xatartii, FARIN. Ann. Sc. Nat. vol. ii. (1834), p. 122. — FERUS. Bull. Zool. 1835, p. 41.

Arianta arbustorum, BECK, Index Moll. Mus. Christ. Frid. p. 41. — HARTM. Erd und Süssw. Gast. pt. 1, p. 55, pl. 15, p. 140, pl. 43.

Helix Wittmanni, ZAWADZKY, Rossmässl. Iconog. Land und Süssw. Moll. pt. 5, f. 279 d.

,, *alpestris*, ZIEGL. in Rossmässl. Iconog. Land und Süssw. Moll. pt. 5, f. 297 b.

(Monstrosities), FERUS. Hist. Moll. Terr. pl. 29, f. 1, 2, 3.—HARTM. Erd und Süssw. Gast. pl. 73, f. 1 to 8.— WOOD, Index Test. Suppl. pl. 7, f. 6 (*H. turgidula*).

Depressed globular, not very thin, subopaque, glossy, with extremely delicate, longitudinal wrinkles, which are chiefly evident at the suture, and minute undulating spiral striæ, rich brown, closely marbled with small linear yellowish, or paler opaque spots, which are usually confluent and angular; and almost always girt with a single darker brown narrow fillet, which winds along the base of the upper volutions, and displays itself rather above the middle of the body-whorl. Spire more or less raised, but variable in amount of elevation. Whorls six in number, convex and well defined, the last one rounded; axis perforated, umbilicus almost concealed. Aperture rounded-lunate, broader than high; peristome white, thickened within, strongly reflected, rather constricted behind, and a little dilated at the umbilicus.

Fair-sized specimens average, for the most part, three quarters of an inch in diameter, and eight lines in height, but vary considerably in their proportions; occasionally the ground colour is pale olive, and the specks opaque white.

The animal is roughly granulated, and of a dusky greenish hue, often very dark, or nearly black, becoming paler and greyish on the margins of the foot.

It is generally distributed throughout woods, and among damp gardens in all parts of the British Isles. It is remarkable for extending its range to a higher altitude on mountains than any other of our larger *Helices*. In the Alps it nearly approaches the snow line. The examples taken in such localities are comparatively small and stunted.

H. Cantiana, Montagu.

Depressed globular, semitransparent, bald when adult, pallid above, rufous below and towards the lip, periphery not angulated; outer lip edged within; umbilicus moderately large.

Plate CXVI. fig. 8, 9.

Helix Cantiana, Mont. Test. Brit. p. 422, and Suppl. p. 145, pl. 23, f. 1.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 197.—Dorset Catalog. p. 53, pl. 19, f. 21.—Fleming, Brit. Anim. p. 261.—Gray, Manual L. and F. W. Shells, p. 144, pl. 3, f. 26.—Brown, Illust. Conch. G. B. p. 46, pl. 17, f. 15 to 17.—Chemn. (ed. Küst.) Conch. Cab. Helix, No. 89, pl. 16, f. 19, 20.—L. Pfeif. Monog. Helic. vol. i. p. 133.
? ,, *crepuscularis*, Gmelin, Syst. Nat.
,, *pallida*, Donov. Brit. Shells, vol. v. pl. 157, f. 2.
,, *Carthusiana*, Drapar. (not Müller), Moll. Terr. et Fluv. France, p. 102, pl. 6, f. 33.—Turton, Manual L. and F. W. Shells, p. 36, pl. 3, f. 26.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 336, 508.—Lam. (ed. Desh.) vol. viii. p. 62.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 3, p. 26, pl. 6, f. 2, 3.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 6, p. 36, f. 364.
Theba ,, Risso, Hist. Nat. l'Europe Mérid. vol. iv. p. 74.
Fruticola ,, Held, Isis, 1837, p. 914.
Bradybæna Cantiana and *Brunonensis*, Beck, Index Moll. Mus. Christ. Frid. p. 19.

Shell depressed, globular, rather thin, bald when adult, pale and hispid when young, with a kind of resinous lustre, of a pallid flesh-colour or pale reddish white above, more rufous below and near the outer lip, frequently with a pale band in the middle of the whorl, and always paler towards the suture, sometimes entirely white; surface a little uneven, and pitted with slight transverse depressions, faintly wrinkled with irregular longitudinal striolæ that are more distinct above than below. Spire not much elevated. Whorls six, rounded, of rather quick increase, the last ventricose and not at all carinated, not deflected at its termination. Aperture reddish, nearly lunate, equal in breadth to half the basal diameter, rather inferior in height. Peristome acute, very little reflected, a little dilated upon the columella, its internal rib white or pale rose-coloured. Base convex; umbilicus deep but rather small, not concealed by the pillar lip.

Diameter about three quarters of an inch.

The animal is of a general greyish hue, becoming darker on the head and neck, where it is tinged with brown.

It is chiefly to be found among brambles and by hedges in the district around London and the counties to the south of the Thames. It has been taken in the west of England. The Irish recorded locality is very doubtful.

H. CARTHUSIANA, Müller.

Rather small, depressed, whitish, bald; mouth margined within by a milk white rib; umbilicus minute.

Plate CXVI. fig. 5, 6.

Helix Carthusiana, MÜLLER, Hist. Verm. pt. 2, p. 15. — TURTON, Manual L. and F. W. Shells, p. 37, f. 27.—GRAY, Manual L. and F. W. Shells, p. 146, pl. 3, f. 27. — BROWN, Illust. Conch. G. B. p. 46, pl. 17, f. 49, 50, 51. — CHEMN. (ed. Küst.) Conch. Cab. Helix, No. 90, pl. 16, f. 21, 22. — L. PFEIF. Monog. Helic. vol. i. p. 132.

„ *nitida*, CHEMN. Conch. Cab. vol. ix. p. 103, pl. 127, f. 1130, 1131.

„ *nemoralis*, *var.* ββ. GMELIN, Syst. Nat.

„ *Carthusianella*, DRAPAR. Moll. Terr. et Fluv. France, p. 101, pl. 6, f. 31, 32, and pl. 7, f. 3, 4.—LAM. (ed. Desh.) vol. viii. p. 61. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 3, p. 25, pl. 6, f. 1.—KRYNICKI, Bull. Soc. Nat. Moscou, vol. ix. p. 183.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 6, p. 37, f. 366. — MORELET, Moll. Terr. et Fluv. Portugal, p. 62.

„ *Gypsii*, FERUS. Journ. Physiq. xc. 300 (for Gibbü).

„ *Olivieri*, *var.* γ. FERUS. Prodrom. Moll. p. 255.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 3, p. 25, pl. 6, f. 4.

„ *rufilabris*, JEFFREYS, Trans. Linn. vol. xvi. p. 509.

Helix zenobia bimarginata, Gray, Medical Repository (fide Gray).
Theba Charpentieri and *Carthusianella*, Risso, Hist. Nat. l'Europe Mérid. vol. iv. p. 76.
Monacha Carthusianella, Fitzing. Syst. Verz. Erzh. Weichth. p. 95.
Fruticola „ Held, Isis, 1837, p. 914.
Bradybæna Carthusiana, Beck, Index Moll. Mus. Christ. Frid. p. 19.

Shell rather small, depressed, sub-globular, rather thin, a little translucent, bald, rather shining, of a whitish horn colour, usually tinged more or less distinctly with rufous near the termination of the last whorl, where it is obscurely marked with a paler subcentral band; surface nearly smooth or obsoletely striolated, usually covered with minute indentations which are sometimes obsolete. Spire very little raised, usually mammillary, the first whorl or two being comparatively prominent. Volutions five and a half but little convex, compact yet rather quickly enlarging towards the last whorl, which is well rounded at the circumference, somewhat deflected at its termination. Aperture broadly lunate, broader than high, fully equal in width to half the total diameter, with an internal approximate whitish rib, which is clearly distinguishable externally. Peristome acute, somewhat expanded, reddish or liver-coloured, becoming straightish at the base, reflected over the very small umbilicus so as partially (rarely entirely) to conceal it. Base rather rounded.

Diameter not quite half an inch; more frequently three-eighths only in English specimens: the smaller forms are usually the more transparent and elevated.

The animal is pale, slightly brownish in the neck; the mantle is speckled with black and yellow.

This is one of our extreme south-eastern species, being found only on the chalky downs of Kent and Surrey.

H. nemoralis, Linnæus.

Depressed-globose, imperforated when adult, with or without coloured bands, not marbled; outer lip reflected; pillar lip callous, retiring.

Plate CXV. fig. 1 to 4.

Helix nemoralis, Linn. Syst. Nat. ed. 12, p. 1247.—Pennant, Brit. Zool. ed. 4. vol. iv. p. 135, pl. 84, f. 126.—Pulteney, Hutchins, Hist. Dorset, p. 48.—Donov. Brit. Shells, vol. i. pl. 13.—Mont. Test. Brit. p. 411. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 206.—Dorset Catalog. p. 54, pl. 21, f. 1, 2, 3, 4, 5, 8, 14, 19. — Turton, Conch. Diction. p. 59. — Gray, Annals of Philos. vol. x. (1825), p. 152. — Fleming, Brit. Anim. p. 264.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 329. — Turton, Manual L. and F. W. Shells, p. 33, f. 23. — Gray, Manual L. and F. W. Shells, p. 132, pl. 3, f. 23. — Thompson, Ann. Nat. Hist. vol. vi. p. 22. — Brown, Illust. Conch. G. B. p. 43, pl. 16, f. 1, 2, 3, 4, 7, 8, 9, 10.— Chemn. Conch. Cab. vol. ix. f. 1196, 1198. —Drapar. Moll. Terr. et Fluv. France, p. 94, pl. 6, f. 3, 4, 5.—Ferus. Prodrom. Moll. p. 56; Hist. Moll. Terr. et Fluv. pl. 32, a. f. 2; and pl. 33, pl. 34, pl. 39, a. f. 3, 4 (Helicogena) animal. —Lam. (ed. Desh.) Anim. s. Vert. vol. viii. p. 53.—Sturm. Fauna, sect. vi. pt. 2, pl. 6. — C. Pfeif. Deutsch. Land und Sussw. Moll. pt. 1, p. 27, pl. 2, f. 10, 11; and pt. 3, pl. 2, 3. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 57, f. 5; pt. 5, p. 6, f. 298; pt. 8, p. 26, f. 494.— Guérin, Iconog. Moll. pl. 6, f. 7.—Charpent. N. Denks. Schweiz. Ges. Nat. p. 7, pl. 1, f. 5 (Eryptomphalus). — Morelet, Moll. Terr. et Fluv. Portugal, p. 68. — L. Pfeif. Monog. Helic. vol. i. p. 276.

,, *hortensis*, Müller, Hist. Verm. pt. 2, p. 57.—Mont. Test. Brit. p. 412. —Fleming, Brit. Anim. p. 264.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 330.—Turton, Manual L. and F. W. Shells, p. 34, f. 24. — Gray, Manual L. and F. W. Shells, p. 130, pl. 3, f. 24.—Maccgil. Moll. Aberd. p. 82.—Brown, Illust. Conch. G. B. p. 44, pl. 16, f. 11, 15, 19. — Chemn. Conch. Cab. vol. ix. f. 1199 to 1201. — Drapar. Moll. Terr. et Fluv. France, p. 95, pl. 6, f. 6. — Ferus. Prodrom. Moll. p. 57; Hist. Moll. Terr. et Fluv. pl. 35, pl. 36, pl. 39, b. f. 2 (Helicogena), animal. — Lam. (ed. Desh.) Anim. s. Vert. vol. viii. p. 54.—C. Pfeif. Deutsch. Land und Sussw. Moll. pt. 1, p. 29, pl. 2, f. 12, 13; and pt. 3, pl. 2, 3, 4.—Sturm.

Deutsch. Fauna, sect. 6, pt. 2, pl. 7. — Rossmässl. Iconog. Land und Sussw. Moll. pt. 1, p. 59, f. 6; and pt. 5, p. 6, f. 299, 300.—Gould, Invert. Massach. p. 172.

Cochlea fasciata, Da Costa, Brit. Conch. p. 76, pl. 5, f. 1, 2, 3, 4, 5, 8, 19.

Helix hybrida, Poiret, Coq. Terr. et Fluv. Aisne, p. 71.— Gray, Manual L. and F. W. Shells, p. 132, pl. 11, f. 130. — Thompson, Ann. Nat. Hist. vol. vi. p. 206.—Brown, Illust. Conch. G. B. p. 44. pl. 18, f. 27, 28.

„ *fusca*, Poiret, Coq. Fluv. et Terr. de l'Aisne, p. 71.

„ *mutabilis*, Hartm. Neue Alpina, vol. i. p. 242.

Helicogena nemoralis, Risso, Hist. Nat. l'Europe Mér. vol. iv. p. 60.

„ *libellula*, Risso, Hist. Nat. l'Europe Mér. vol. iv. p. 62, pl. 3, f. 21.*

Helix cincta and *quinquefasciata*, Shep. Trans. Linn. Soc. vol. xiv. p. 163.

Cepæa nemoralis and *hortensis*, Held, Isis, 1837, p. 910.

Helicogena hortensis and *hybrida*, Beck, Index Moll. Mus. Christ. Frid. p. 39.

Tachea „ Leach, MSS. Hartm. Erd und Süssw. Moll. pt. 1, p. 24, pl. 9, 10.

Helix subglobosa, Binney, Bost. Journ. Nat. Hist. vol. i. p. 485, f. 7. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. (1837).

„ *lucifuga*, Zeigl. in Hartm. Erd und Sässw. Gast. vol. i. p. 191, pl. 70.

(Monstrosities), Chemn. Conch. Cab. vol. ix. pl. 109, f. 924 (ed. Küst.), Helix, pl. 12, f. 3, 4. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 3, pl. 2, f. 6, 7. — Ferus. Hist. Moll. pl. 28, B. f. 10; pl. 32, A. f. 2; pl. 34, f. 8, 9; pl. 36, f. 10, 11, 12.

Shell moderately large, sub-globose, rather strong, subopaque, rather glossy, more or less wrinkled by the lines of growth, and most minutely and undulatingly striolated in a spiral direction, extremely variable in colouring, sometimes banded, sometimes of an uniform tint, but never mottled, marbled, nor otherwise variegated. Spire somewhat raised but never equal in height to the body whorl. Volutions five, moderately convex, clearly but not profoundly defined; the last wide and broadly rounded, and deflected at its termination. Aperture rudely crescent-shaped, somewhat angulated below, broader than high, occupying rather more than half of the total diameter. Peristome reflected, thickened internally; outer lip arcuated; columella lip callous and nearly straight; the lips and parietal surface of the aperture of a lighter or darker chocolate brown in the typical variety, occasionally white or rose-coloured. Base much rounded, projecting near the pillar lip, quite imperforate when adult, slightly umbilicated when young.

The most ordinary colours of this snail are yellow, brownish-drab, and flesh-colour, with from one to five zones of chocolate brown, or more rarely with two bands of the latter hue, occupying so large a surface as to leave only a linear portion of the ground-colour between them, another narrow one just beneath the suture, and a third broad zone in the middle of the lower disk. An extremely common form has only a single dark sub-central band (edged sometimes with white) which runs along the base of the lesser volutions. To specify the minor variations would be tedious, so numerous are they, not only in arrangement of colouring, but also in size and elevation or dilatation of the general form. The interior of the mouth is generally pale or whitish, but the more darkly painted shells often exhibit a tinge of violet.

We have followed Pfeiffer, Deshayes, &c., in re-uniting *hortensis* and *hybrida* to the typical *nemoralis*, not being able to detect any peculiarity in individuals of the dark-mouthed form, which is not likewise represented in the white-mouthed variety, between which extremes the *hybrida* is the connecting link.

The usual diameter is about seven-eighths of an inch.

The animal is of an olivaceous yellow except on the neck and upper part of the head, where it is banded by dark brown with a pale linear stripe down the centre. The tentacula are dusky above. The mantle is pale sulphur-yellow. Almost everywhere among the British Islands in gardens and fields, often very abundant and beautifully variegated in the neighbourhood of the sea.

H. PISANA, Müller.

Whitish, with numerous more or less interrupted linear coloured bands on the larger whorls; mouth moderately large, usually pink edged; outer lip margined within; pillar lip partially overlapping the umbilicus.

Plate CXV. fig. 7, 8.

Helix Pisana, MÜLLER Hist. Verm. pt. 2, p. 60.—FLEMING, Brit. Anim. p. 259. —THOMPSON, Ann. Nat. Hist. vol. vi. p. 28.—COUCH, Cornish Fauna, pt. 2, p. 46. — GRAY, Manual L. and F. W. Shells, p. 158, pl. 4, f. 30.—BROWN, Illust. Conch. G. B. p. 50, pl. 17, f. 27, 29, 33, 35, 38.—LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 57. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 6, p. 34, f. 359; and pt. 10, p. 15, f. 614. — MORELET, Moll. Portugal, p. 70. — CHEMN. (ed. Küst.) Conch. Cab. Helix, No. 128, pl. 22, f. 1 to 6; and pl. 37, f. 1 to 12. — L. PFEIF. Monog. Helic. vol. i. p. 152.

,, *zonaria*, PENNANT, Brit. Zool. ed. 4, vol. iv. p. 137, pl. 85, f. 133.

,, *petholata*, OLIVI, Zool. Adriat. p. 178.

,, *cingenda*, MONT. Test. Brit. p. 418, pl. 24, f. 4. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 195, pl. 5. f. 6.—Dorset Catalog. p. 53, pl. 18, f. 5. — TURTON, Conch. Diction. p. 49; Manual L. and F. W. Shells, p. 39, f. 30. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 333, 508.

,, *rhodostoma*, DRAPAR. Moll. Terr. et Fluv. France, p. 56, pl. 5, f. 13, 14, 15.

,, *strigata, var.* DILLW. Recent Shells, vol. ii. p. 911.

Theba Pisana, RISSO, Hist. Nat. l'Europe Mér. vol. iv. p. 73. — BECK, Index Moll. Mus. Christ. Frid. p. 14.

Helix albella, FLEMING, Brit. Anim. p. 260, immature, teste Fleming.

,, *Alboranensis*, WEBB and BERTHELOT (teste Beck), Moll. Canar.

Xerophila Pisana, HELD. Isis, 1837.

Euparypha rhodostoma, HARTM. Erd und Süssw. Gast. pt. 1, p. 204, pl. 79, 80.

Shell sub-globose, a little depressed, moderately strong, sub-opaque, rather glossy but not highly polished, almost smooth, of a squalid or cream white, rarely without markings, usually with more or less numerous very narrow spiral bands of chestnut or chocolate brown, that are frequently interrupted, or a few of them apparently composed of short oblique streak-like spots, occasionally confluent. Spire moderately raised, but depressed above; the apex blunt and dark brown or blackish. Whorls five to five and a half, convex, moderately broad, the last deep, a little flattened above, not deflected, broadly rounded at the peritreme. Aperture broadly lunate, occupying at least half the total diameter, nearly as high as it is wide. Peristome thickened internally and more or less tinged with rose-colour (pale or whitish in a variety) only reflected upon the columella, where it half conceals the narrow umbilicus. Base well rounded.

Diameter about three-quarters of an inch. There are usually two contiguous bands, sometimes confluent, on the centre of the base, with their outer edges feathered or streaked obliquely.

The animal is large, of a yellowish-grey colour, with long purplish upper tentacula and dusky lines along the neck at their bases. The tail is depressed and pointed, and considerably exceeds the shell.

This is one of our local and western snails, having been observed hitherto only in Cornwall, South Wales, and the south-east of Ireland. It is plentiful where it occurs, as at Dublin.

H. VIRGATA, Da Costa.

Depressed, turbinate, smooth, banded; bands not linear; upper whorls for the most part with only a single zone above the suture, mouth usually livid red; outer lip edged internally.

Plate CXVII. fig. 10.

Helix zonaria, var.? Penn. Brit. Zool. ed. 4, vol. iv. p. 138, pl. 85, f. 133, A. probably.

,, *virgata*, Da Costa, Brit. Conch. p. 79, pl. 4, f. 7.—Pulteney, Hutchins, Hist. Dorset, p. 47.—Mont. Test. Brit. p. 415, pl. 24, f. 1.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 195.—Dorset Catalog. p. 53, pl. 20, f. 7. — Turt. Conch. Diction. p. 49. — Jeffreys, Trans. Linn. Soc. vol. xvi. pp. 334, 508. — Turt. Manual L. and F. W. Shells, p. 40, f. 31. — Fleming, Brit. Anim. p. 261. — Gray, Manual L. and F. W. Shells, p. 160, f. 31. — Thompson, Ann. Nat. Hist. vol. vi. p. 28. — Brown, Illust. Conch. G. B. p. 49, pl. 17, f. 42, 43, 44.—Chemn. (ed. Küst.) Conch. Cab. Helix, No. 129, pl. 22, f. 15, 16, 19, 20.—L. Pfeif. Monog. Helic. vol. i. p. 157.

Helix variabilis, Drap. Moll. Terr. et Fluv. France, p. 84, pl. 5, f. 11, 12.—Lam. (ed. Desh.) Anim. s. Vert. vol. viii. p. 58. — C. Pfeif. Deutsch. Land und Süsswas. Moll. pt. 3, p. 28, pl. 6, f. 10, 13. — Philippi, Moll. Sicil. vol. i. p. 132. — Rossmässl. Iconog. Land und Süsswas. Moll. pt. 6, p. 31, f. 356.—Dupuy, Moll. du Gers, p. 16. — Morelet, Moll. Terr. et Fluv. Portugal, p. 72.

? ,, *ericetorum*, Chemn. Conch. Cab. vol. ix. f. 1194, 1195.

,, *zonaria*, Donov. Brit. Shells, vol. ii. p. 65.

,, *subalbida*, Poiret, Prodr. Coq. Terr. et Fluv. Aisne, p. 83.

,, *striata*, Brard, Coq. Terr. et Fluv. Paris, p. 36, pl. 2, f. 5, 6.

,, *Pisani*, Dillw. Recent Shells, vol. ii. p. 911.

Xerophila variabilis, Held, Isis, 1837, p. 913.

Theba virgata, Beck, Index Moll. Mus. Christ. Frid. p. 14.

var. *Helix monilifera*, Menke, Synopsis Mollusc. ed. 2, p. 22.

var. ,, *Terverii*, Michaud, Comp. Drap. Moll. Terr. et Fluv. France, p. 26, pl. 14, f. 20, 21. — Rossmässl. Iconog. Land und Süsswas. Moll. pt. 6, f. 354 d; and pt. 9, p. 7, f. 565, 566.

Xerophila ,, Held, Isis, 1837, p. 913.

Theba ,, Beck, Index Moll. Mus. Christ. Frid. p. 12.

Shell of a somewhat depressed, turbinate form, moderately strong, nearly opaque, not polished, smooth or faintly striated, adorned with chocolate-coloured or rich dark brown spiral bands on a white ground, frequently with a rather broad band winding along the base of the lesser volutions, and continued just above the middle of the body whorl, with three or four additional narrow bands of the same hue upon the basal region of the shell, which are occasionally confluent, and one or sometimes two of them broken into streaks or spots. Spire somewhat raised;

apex brown or horn-coloured, a little blunt. Whorls five to six, rather convex, gradually increasing, the last a little deflected. Aperture rounded, lunate, generally about equal in breadth to half the basal diameter, not quite so high; dirty red or purplish liver colour, usually with a whitish thread-like elevation surrounding it. Peristome acute, not reflected, except upon the columella. Base decidedly convex, umbilicus deep but not large.

This species varies very much in size; half an inch is the diameter of our larger specimens, but individuals measuring three quarters of an inch are likewise recorded. The diversities of colouring which it exhibits are very remarkable; among them we may reckon a dark brown variety with a single white band, an opaque white one with transparent, colourless zones, &c.

The animal is pale on the sides, purplish on the neck and head.

This snail is found in prodigious numbers on many chalk and limestone districts, and on sandy places in their neighbourhood. It also affects the neighbourhood of the sea. Though local, it occurs in most parts of Britain, the north of Scotland excepted. It is widely diffused through Central and Southern Europe.

H. CAPERATA, Montagu.

Depressed, pallid, brown; banded, with regular close-set raised wrinkles; body slightly angulated at the periphery; mouth very small; outer lip edged with white internally; umbilicus moderately large.

Plate CXVII. fig. 7.

Helix caperata, MONT. Test. Brit. p. 430, pl. 11, f. 11. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 196. — Dorset Catalog. p. 53, pl. 19, f. 20. — TURT. Conch. Diction. p. 51. — FLEMING, Brit. Anim. p. 262. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 335.—TURT. Manual L. and F. W. Shells, p. 42, f. 32.—GRAY, Manual L. and F. W. Shells, p. 162, pl. 4, f. 32.—MACGIL. Moll. Aberd. p. 84. — BROWN, Illust. Conch. G. B. p. 49, pl. 17, f. 37, 39. — Index Testaceolog. pl. 33, f. 21. — CHEMN. (ed. Küst.) Conch. Cab. Helix, No. 132, pl. 22, f. 11 to 14.—L. PFEIF. Monog. Helic. vol. i. p. 167.

Helix striata, DRAP. Moll. Terr. et Fluv. France, p. 106, pl. 6, f. 18, 19.—LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 75. — C. PFEIF. Deutsch. Land und Süsswas. Moll. pt. 3, p. 31, pl. 6, f. 23. — ROSSMÄSSL. Iconog. Land und Süsswas. Moll. pt. 6, p. 28, f. 354.

„ *intersecta*, POIRET, Coq. Paris, p. 81 ?—BRARD, Coq. Terr. et Fluv. Paris, p. 39, pl. 2, f. 7.—LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 61 ?

„ *crenulata*, DILLW. Recent Shells, vol. ii. p. 895.

Xerophila striata, HELD, Isis, 1837, p. 913.

Theba intersecta, BECK, Index Moll. Mus. Christ. Frid. p. 12.

Shell rather small, depressed-globular, not very thin, scarcely at all shining; not translucent, of a squalid white, cream colour, or cinereous, with spiral bands of various shades of brown, which are frequently interrupted, and vary much in number and intensity; the body in general adorned with a subcentral, and for the most part broadish band (either interrupted or entire), which winds along the base of the lesser volutions likewise; besides which from three to five fillets, at times rather indistinct ones, encircle the lower disk; occasionally the shell is brown, with a white edging below the dark upper band, and is speckled underneath with white; entire exterior marked lengthways with crowded costellar wrinkles. Spire a little raised; apex rather blunt, darkish or pellucid. Whorls six, convex, tolerably broad, not suddenly enlarging; the body not deflected, more or less subangulated at the circumference. Aperture abbreviatedly lunate, only equal to two-fifths the total diameter, nearly as high as broad. Peristome, strongly ribbed internally with white fulvous or pinkish flesh-colour, acute at the edge, only reflected near the columella, where it is dilated, but does not at all conceal the perforation. Base moderately convex; umbilicus deep, large at its commencement, but contracted by the penult whorl.

About three-eighths of an inch is the ordinary diameter; one of our larger specimens measures more than five lines.

The animal is pale grey; silvery and slightly brown on the summit of the neck, which has a dusky band on each side passing on to the dusky tentacles. The sides of foot and the tail, which is short, are very pale.

It is most common on and in the neighbourhood of calcareous soils. It occurs abundantly also in some trap districts, and Mr. Macgillivray notices the only locality for it near Aberdeen as being an old granite wall. It is local, but widely diffused, occurring very abundantly in the south. It is, however, an inhabitant of all our districts.

H. ERICETORUM, Müller.

Depressed, semitransparent, not regularly striated, banded with brownish yellow; mouth small; outer lip acute, not edged with colouring matter; umbilical region capacious.

Plate CXVII. fig. 4.

PETIVER, Gazophylac. pl. 93, f. 18.

Helix Itala, LINN. Syst. Nat. ed. 12, p. 1245 (from type).

,, *ericetorum*, MÜLLER, Hist. Verm. pt. 2, p. 33. — PULTENEY, Hutchins, Hist. Dorset, p. 47.—MONT. Test. Brit. p. 347, pl. 24, f. 2. — DONOV. Brit. Shells, vol. v. pl. 151, f. 2. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 194.—Dorset Catalog. p. 53, pl. 20, f. 8.—TURT. Conch. Diction. p. 49.—FLEMING, Brit. Anim. p. 260. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 338. — TURT. Manual L. and F. W. Shells, p. 54, f. 37.—GRAY, Manual L. and F. W. Shells, p. 163, pl. 4, f. 37.—THOMPSON, Ann. Nat. Hist. vol. vi. p. 30.—

Brown, Illust. Conch. G. B. p. 50, pl. 17, f. 21, 23, 34 (ericitorum). — Chemn. Conch. Cab. vol. ix. f. 1193. — Férus. Prodrom. Moll. No. 281.—Lam. (ed. Desh.) Anim. s. Vert. vol. viii. p. 60. — C. Pfeif. Deutsch. Land und Süsswas. Moll. pt. 1, p. 38, pl. 2, f. 23.—Rossmässl. Iconog. Land und Süsswas. Moll. pt. 1, p. 67, f. 17; and pt. 8, p. 33, f. 517. — Krynicki, Bull. Soc. Nat. Moscou, vol. ix. p. 190.—Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. (1837), p. 12, pl. 1, f. 18. — Chemn. (ed. Küst.) Conch. Cab. Helix, No. 131, pl. 22, f. 21 to 26.—L. Pfeif. Monog. Helic. vol. i. p. 163.

Helix striata, Müller, Hist. Verm. pt. 2, p. 38 (teste Beck), dead.
„ *albella*, Penn. Brit. Zool. ed. 4, vol. iv. p. 132, pl. 85, f. 122.
„ *erica*, Da Costa, Brit. Conch. p. 53, pl. 4, f. 8.
„ *nivea*, Gmelin, Syst. Nat. p. 3639 (dead).
„ *cespitum*, *b*. Drap. Moll. Terr. et Fluv. France, pl. 6, f. 16, 17. — C. Pfeif. Deutsch. Land und Süsswas. Moll. pt. 2, p. 39, pl. 2, f. 24, 25.
Oxychilus ericetorum, Fitzing. Syst. Verz. Erzh. Weichth. p. 100.
Hellicella „ Risso, Hist. Nat. l'Europe Mer. vol. iv. No. 155.
Theba „ Beck, Index Moll. Mus. Christ. Frid. p. 13.
Xerophila „ Held, Isis, 1837, p. 913.
Helix dubia, Hartmann.

Depressed, moderately firm, subopaque or semitransparent, indistinctly striated above, wrinkled below, somewhat glossy, whitish or pale horn-coloured, with generally a yellowish brown band winding along the base of the smaller volutions, and running at some little distance from the suture upon the body-whorl. This principal fillet is sometimes obscure or entirely wanting, and in a rare variety it is interrupted and dispersed over the upper side of the whorls in transverse streaks; generally also there are from four to six narrower and less conspicuous spiral bands below the primary one. Spire scarcely raised; apex brown or horn-coloured; whorls six, moderately convex, gradually increasing, the last cylindrical and more or less sloping downwards at its termination. Aperture small, roundish, only exhibiting the external colouring, not much interrupted by the penultimate volution, rather longer than broad. Peristome thin, and not reflected, the columellar portion somewhat dilated, margins approximate. Umbilicus very large and deep, displaying three or four of the volutions.

The diameter is generally four-fifths, occasionally five-sixths, of an inch, whilst the height rarely attains to four lines. In some of the smaller varieties the spire is more elevated than in the typical forms.

The animal is pale, greenish or greyish, darker on the neck and head.

This snail prefers calcareous soils, and is in many places abundant on sandy shores, especially near the sea. It is widely diffused through the British isles, ranging to the north of Scotland.

H. OBVOLUTA, Müller.

Orbicular, of an uniform brown; spire concave; umbilicus spread; peristome reflected.

Plate CXVII. fig. 1, 2, 3.

Helix obvoluta, MÜLLER, Hist. Verm. pt. 2, p. 27.—LINDSAY, Trans. Linn. Soc. vol. xvi. p. 765.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 510. —GRAY, Manual L. and F. W. Shells, p. 139, pl. 11, f. 131. — BROWN, Illust. Conch. G. B. p. 53, pl. 18*, f. 13, 14.— FÉRUS. Prodrom. Moll. No. 107; Hist. Moll. Terr. et Fluv. pl. 51, f. 4 (Helicodonta). — LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 63.—C. PFEIF. Deutsch. Land und Süsswas. Moll. pt. 1, p. 41, pl. 2, f. 28. — BLAINV. Man. Malacolog. p. 461, pl. 40, f. 7. — ROSSMÄSSL. Iconog. Land und Süsswas. Moll. pt. 1, p. 69, f. 61. — DESH. in Férus. Hist. Moll. p. 16. — CHEMN. (ed. Küst.) Conch. Cab. pl. 64, f. 13, 14, 15. — L. PFEIF. Monog. Helic. vol. i. p. 413.

„ *trigonophora*, LAM. Journ. Hist. Nat. pl. 42, f. 2.

Helicodonta obvoluta, RISSO, Hist. Nat. l'Europe Mér. vol. iv. p. 65.

Trigonostoma obvolutum, FITZING. Syst. Verz. Erzh. Weichth. p. 98.—HARTM. Erd und Süsswas. Gasterop. pt. 1, p. 14, pl. 6.

Gonostoma „ HELD, Isis, 1837, p. 915.

Vortex obvoluta, BECK, Index Moll. Mus. Christ. Frid. p. 29.

Shell orbicular, depressed on both sides, tolerably strong, more or less glossy, umber-brown, not variegated, a little opaque, somewhat wrinkled (especially above), obscurely hispid, more evidently so below than above; neither keeled nor much rounded at the circumference, but a little subangulated above. Spire concave; apex depressed. Whorls six, narrow, rounded, deeply defined, very slowly enlarging; the penult rather prominent; the last but little deflected, scarcely at all dilated, constricted towards the mouth, where by its abrupt indentation rather above the middle it forms a somewhat toothlike projection upon the inner margin of the outer lip. Aperture somewhat trigonal or foot-shaped, nearly as high as it is broad, not equal in width to half the total diameter of the shell. Peristome reflected, often rather broadly so, paler than the general tint, and frequently of a pinkish hue inside; basal edge straightish, lateral edge not arcuated. Umbilicus very large, but much contracted by the penult whorl.

Diameter about five lines; height only two.

The animal is dusky, the head and neck nearly black, the foot pale.

This curious snail is very rare in Britain; abundant in the more hilly parts of central Europe. Hitherto it has been found only among moss at the roots of trees in Ditcham Wood, near Brenton, Hants, and for some distance on the northern side of the chalk escarpment of the South Downs. Its presence in Britain is questionably indigenous.

H. LAPICIDA, Linnæus.

Depressed orbicular; circumference of the body sharply carinated; peristome white, and reflected.

Plate CXVI. fig. 3, 4.

Helix lapicida, LINN. It. Oel. et Gothl. p. 8; Syst. Nat. ed. 12, p. 1241. — PENN. Brit. Zool. ed. 4, vol. iv. p. 132, pl. 84, f. 121.—PULTENEY, Hutchins, Hist. Dorset, p. 46.—DONOV. Brit. Shells, vol. ii. pl. 39, f. 2.—MONT. Test. Brit. p. 435. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 187. — Dorset Catalog. p. 52, pl. 20, f. 9. — GRAY, Manual L. and F. W. Shells, p. 140, pl. 5, f. 51. — BROWN, Illust. Conch. G. B. p. 46, pl. 17, f. 9, 10, 11.—CHEMN. Conch. Cab. vol. ix. pt. 2, p. 88, pl. 126, f. 1107.—DRAP. Moll. Terr. et Fluv. France, p. 111, pl. 7, f. 35, 36, 37.—FÉRUS. Prodrom. Moll. No. 150; Hist. Nat. Moll. Terr. et Fluv. pl. 66, f. 6 (Helicella). — C. PFEIF. Deutsch. Land und Süsswas. Moll. pt. 1, p. 40, pl. 2, f. 26, 27. — ROSSMÄSSL. Iconog. Land und Süsswas. Moll. pt. 1, p. 63, f. 11. — CHARPENT. N. Denks. Schweiz. Ges. Nat. vol. i. (1837). p. 9, pl. 1, f. 7, 8 (Carocolla). — MORELET, Moll. Terr. et Fluv. Portugal, p. 57. — CHEMN. (ed. Küst.) Conch. Cab. Helix, No. 120, pl. 20, f. 10, 11; and pl. 38, f. 30, 31.—L. PFEIF. Monog. Helic. vol. i. p. 370.

„ *acuta*, DA COSTA, Brit. Conch. p. 53, pl. 4, f. 9.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 344, 512.

„ *affinis*, GMELIN, Syst. Nat. p. 3621.

Carocolla lapicida, LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 148.—FLEMING, Brit. Anim. p. 258.—TURT. Manual L. and F. W. Shells, p. 66, f. 51.

Helicogona „ RISSO, Hist. Nat. l'Europe Mér. vol. iv. p. 66.

Latomus „ FITZING. Syst. Verz. Erzh. Weichth. p. 97.

Lenticula „ HELD, Isis, 1837, p. 913.

Chilotrema „ BECK, Index Moll. Mus. Christ. Frid. p. 28.

Helix Rhenana, HARTMANN.

Shell depressed, lenticular, fully as convex below as above, most delicately shagreened, very sharply carinated upon the middle of the body-whorl, thin, slightly transparent, not polished, yellowish, horn-coloured, or pale rufous with alternating darker stains of deep chestnut. Whorls five, slightly convex, moderately broad, gradually enlarging; the last suddenly deflected near the aperture; apex blunt. Aperture somewhat oval, much broader than high, occupying about three-sevenths of the total diameter. Peristome white, united, not appressed upon the body, slightly notched by the termination of the keel, below which it is arcuated, retiring, reflected, and a little thickened. Base most prominent immediately around the deep and widely open umbilicus, thence sloping to the carina.

The diameter is usually three-quarters of an inch.

The animal is of a general dusky hue, with dark brown stripes running along the neck and on to the tentacula, both upper and lower. The sides of the foot are pale brown or greenish. The tail is slender, but rather obtuse, and scarcely extends beyond the shell.

This very peculiar snail is locally distributed in England, and to be sought for in limestone and chalky districts. It occurs abundantly in the south-eastern counties, and in Derbyshire. It is not found either in Ireland or Scotland. It ranges northwards to Sweden, and southwards to the Pyrenees.

H. RUFESCENS, Pennant.

Depressed, bald, rufous, subangulated and whitish at the periphery; outer lip remotely edged with white internally; umbilicus moderately large.

Plate CXVIII. fig. 4, 7.

Helix clandestina, BORN, Mus. Cæs. Vind. (teste Hartmann).
„ *rufescens*, PENN. Brit. Zool. ed. 4, vol. iv. p. 134, pl. 85, f. 127 (badly). — DA COSTA, Brit. Conch. p. 80, pl. 4, f. 6. — PULTENEY, Hutchins, Hist. Dorset, p. 47. — MONT. Test. Brit. p. 420 (not young), pl. 23, outer f. 2.—DONOV. Brit. Shells, vol. v. pl. 157, f. 1.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 196 (not young). — Dorset Catalog. p. 53, pl. 20, f. 6. — TURT. Conch. Diction. p. 52 (not young). — JEFFREYS,

Trans. Linn. Soc. vol. xvi. p. 337. — Turt. Manual L. and F. W. Shells, p. 37, f. 28. — Gray, Manual L. and F. W. Shells, p. 156, pl. 3, f. 28. — Brown, Illust. Conch. G. B. p. 46, pl. 17, f. 47, 53. — Chemn. (ed. Küst.) Conch. Cab. Helix, No. 87, pl. 16, f. 13 to 16.—L. Pfeif. Monog. Helic. vol. i. p. 141.

?*Helix turturum*, Gmelin, Syst. Nat.
„ *Altenana*, Klees, Test. Tubing. (teste Férus.)
„ *corrugata* and *clandestina*, W. Hartm. in Neue Alpina, i. p. 256.
„ *circinata*, Studer, Verz. Schweiz. Conch. p. 12.—Ferus. Prodrom. Moll. No. 268. — Rossmässl. Iconog. Land und Süsswas. Moll. pt. 1, p. 63, f. 12 a; and pt. 7, f. 422.
„ *montana;* C. Pfeif. Deutsch. Land und Süsswas. Moll. pt. 3, p. 33, pl. 6, f. 10. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. (1837), p. 11, pl. 1, f. 17 (Helicella).
Fruticola circinata, Held, Isis, 1837, p. 914.
Bradybæna rufescens and *circinata*, Beck, Index Moll. Mus. Christ. Frid. p. 20.
Trichia circinata clandestina, Hartm. Erd und Süsswas. Gast. 1, p. 125, pl. 38.
var. *Helix cælata*, Studer, Schweiz. Conch. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. (1837), p. 11, pl. 1, f. 13.—Desh. Encycl. Méth. Vers, vol. ii. p. 219.
Bradybæna cælata, Beck, Index Moll. Mus. Christ. Frid. p. 20.
„ *Helix montana*, Studer, Verz. Schweiz. Conch. p. 12.
„ „ *striolata*, C. Pfeif. Deutsch. Land und Süsswas. Moll. pt. 3, p. 28, pl. 6, f. 8.
„ „ *circinata var. montana*, Rossmässl. Iconog. Land und Süsswas. Moll. pt. 1, p. 63, f. 126, and pt. 7, f. 423.
„ „ *rufina*, Parreys in Pfeif. Symbolæ, pt. i. p. 39.
„ „ *Parreysii*, Fitzinger, Verz. Erzh. Weichth.

Shell depressed, never hispid, rather thin, and a little translucent, coarsely striated lengthways, rather dull, in general of a reddish horn-colour, but ranging in tint from almost white to rufous brown, colouring usually disposed in alternate darker and lighter shades, subcarinated upon or above the middle, the angulation rendered more apparent by being of a paler tint. Spire (in the more typical form) scarcely raised; apex not particularly blunt. Whorls six, moderately convex, not abruptly enlarging; the last neither deflected above, nor sinking at its termination below the general level of the base. Aperture nearly crescent-shaped, broader than high, about equal in breadth to half the total diameter. Peristome thin, usually dark liver-coloured within, edged inside with a remote white rib, slightly expanding above, reflected below, dilated upon the columella, where it is subarcuated and rather oblique. Umbilicus large and profound.

Diameter half an inch; specimens of three-quarters of an inch in diameter have been recorded, but are not common. A smaller, stronger, and more globular form exists in the north, with a more elevated spire, and a paler style of colouring both externally and internally.

The animal is grey upon the head and neck, with dark or brownish bands; its tentacles are long, the sides of the foot are pale yellowish white. The foot itself is narrow, and terminates in an acute tail, which does not project beyond the shell when the creature is crawling.

This snail is most abundant, and the specimens finest in limestone and chalk districts. In the south of England and Ireland it is very common, more so than in the northern parts of the British islands.

H. HISPIDA, Linnæus.

Reddish horn-coloured, more or less depressed; outer lip edged below with white internally; umbilicus moderately large.

Plate CXVIII. fig. 1, 2, 3, and (animal) Plate G.G.G. f. 1.

Helix hispida, LINN. Syst. Nat. ed. 12, p. 1244.—DA COSTA, Brit. Conch. p. 58, pl. 5, f. 10.—PULTENEY, Hutchins, Hist. Dorset, p. 47.—DONOVAN, Brit. Shells, vol. v. pl. 151, f. 1.—Dorset Catalog. p. 54, pl. 21, f. 10.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 338.—TURT. Manual L. and F. W. Shells, p. 57, f. 41.—GRAY, Manual L. and F. W. Shells, p. 154, pl. 4, f. 41.—THOMPSON, Ann. Nat. Hist. vol. vi. p. 27.—MACGILLIV. Moll. Aberd. p. 85.—BROWN, Illust. Conch. G. B. p. 48, pl. 17, f. 40, 46.—MÜLLER, Hist. Verm. pt. 2, p. 73.—DRAP. Moll. Terr. et Fluv. France, p. 103, pl. 7, f. 20, 21, 22.—LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 73.—C. PFEIF. Deutsch. Land und

Susswas. Moll. pt. i. p. 36, pl. 2, f. 20.—KRYNICKI, Bull. Soc. Nat. Moscou, vol. ix. p. 180. — ROSSMÄSSL. Iconog. Land und Süsswas. Moll. pt. 7, p. 2, f. 426, 427.—CHEMN. (ed. Küst.) Conch. Cab. Helix, no. 634, pl. 98, f. 19, 20, 21.—L. PFEIF. Monog. Helic. vol. i. p. 148.

Helix rufescens, young, MONT. Test. Brit. Suppl. p. 145, pl. 23, inner fig. 2.—TURT. Conch. Diction. p. 52. — FLEMING, Brit. Anim. p. 261.

,, *sericea*, C. PFEIF. Deutsch. Land und Süswas. Moll. pt. 1, p. 34, pl. 2, f. 17. — ALDER, Trans. Nat. Hist. Soc. Northumb. vol. ii. p. 340, teste Alder. — GRAY, Manual L. and F. W. Shells, p. 153. — BROWN, Ill. Conch. G. B. p. 48.

,, *concinna*, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 337, 510.—ALDER, Mag. Zool. and Bot. vol. ii. p. 107; Trans. Nat. Hist. Soc. Northumb. vol. ii. p. 340. — GRAY, Manual L. and F. W. Shells, p. 154, pl. 12, f. 135. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 124.—BROWN, Illust. Conch. G. B. p. 48.

,, *plebeium*, JEFFREYS, Trans. Lin. Soc. vol. xvi. p. 510.

Helicella hispida, Fitzing. Syst. Verz. Erzh. Weichth. p. 96.

Fruticola hispida, HELD, Isis, 1837, p. 914.

Helix depilata, ALDER, Mag. Zool. and Bot. vol. ii. p. 107. — GRAY, Manual L. and F. W. Shells, p. 155, pl. 12, f. 135.*—BROWN, Illust. Conch. G. B. p. 49.

Bradybæna hispida, BECK, Index Moll. Mus. Christ. Frid. p. 20.

Shell small, thin, semi-transparent, not very lustrous, varying in shape from depressed subglobose to depressed suborbicular, with delicate short and rather deciduous hairs, rufous horn-colour, varying in intensity, sometimes a little variegated by the stage of growth being indicated by darker shades, not granular, more or less strongly wrinkled lengthways, occasionally subangulated, and in that case with an obscure pallid spiral band upon the angulation. Spire a little raised; apex more or less blunt. Whorls five or six, moderately convex, not rapidly enlarging; the last not ventricose, nor distinctly deflected. Aperture small, crescent-shaped, usually more or less depressed, and consequently broader than high, not equal in width to half the total diameter. Peristome acute, neither reflected nor patulous, ribbed with white internally.

especially near the base, which is a little disposed to expand, rather straight, and occasionally forms an angle with the short columellar lip. Base rounded; umbilicus profound, of a moderate size.

Var. *depilata.* Bald, usually more depressed, whorls more rounded, peristome more thickened, columella angulation usually more distinct.

Var. *concinna.* Thicker, hairs few and very deciduous, the umbilicus more displayed, columellar angulation in general more distinct.

Diameter about the third of an inch.

The animal is bluish-white, very pale on the sides of the foot, and on the rather short tail. The neck and summit of head are dark brown; the tentacles are pale-bluish, smooth, and not over long.

It is abundant on waste places, by hedges, and under stones in all parts of the British Isles.

H. REVELATA, Férussac.

Depressed-globular, very thin, olivaceous, downy; whorls four, the last large in proportion; outer lip acute; a small umbilicus.

Plate CXIX. fig. 1, 2, 3,

Helix (*Helicella*) *revelata*, FÉRUS. Prodrom. no. 273.—GRAY, Manual L. and F. W. Shells, p. 152, pl. 11, f. 133. — COUCH, Cornish Fauna, pt. 2, p. 47. — BROWN, Ill. Conch. G. B. p. 48, pl. 17, f. 3, 4, 5. — MICHAUD, Comp. Drap. Moll. France, p. 27, pl. 15, f. 6, 7, 8.—LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 83.—CHEMN. (ed. Küster) Conch. Cab. p. 188, pl. 34, f. 5—8.—L. PFEIF. Monog. Helic. vol. i. p. 65.

„ *badiella*, ZIEGL. (teste Anton.)

Helicella revelata, BECK, Index Moll. Mus. Christ. Frid. p. 7.

Shell depressed-globular, thin, transparent, somewhat glossy, yet not polished, of an uniform greenish olive colour, with rather indistinct longitudinal wrinkles, which are partially concealed by the short and scattered hairs, that clothe the entire exterior. Spire short; apex obtuse; whorls four, well rounded, moderately raised, rapidly enlarging, the last swollen. Aperture rounded crescent-shaped, as high as broad, occupying about one half of the total diameter. Peristome simple acute, spreading and a little reflected near the umbilicus, which is small but deep. Base rounded. Diameter a quarter of an inch.

The animal is said to be grey above, yellowish on sides and foot, with dusky head and tentacula and a dark band on each side of neck.

This is one of our rarest snails. Guernsey (E. F.); on hills near Torquay (S. H.); Magavissey (Couch) and Pendennis (Cocks, Benson) in Cornwall; Devon (Bellamy). Mr. Lowe of Nottingham has lately sent us specimens found by himself at Stanton-on-the-Wolds, a very anomalous locality.

H. SERICEA, Draparnaud.

Depressed globular, pallid, transparent, closely downy; spire more or less raised; umbilicus decidedly small.

Plate CXVIII. fig. 5, 6.

Helix sericea, DRAP. Moll. Terr. et Fluv. France, p. 103, pl. 7, f. 16, 17.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 333.—TURT. Manual L. and F. W. Shells, p. 38, f. 29.—LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 82.—FÉRUS. Prodr. Moll. no. 272 (Helicella).—ROSSMÄSSL. Iconog. Land und Süsswas. Moll. pt. 7, p. 2, f. 428, 429.—KRYNICKI, Bull. Soc. Nat. Moscou, vol. ix. p. 186.—CHEMN. (ed. Küst.) Conch. Cab. Helix, no. 636, pl. 98, f. 25, 26.—L. PFEIF. Monog. Helic. vol. i. p. 145.

„ *hispida*, MONT. (not Linn.) Test. Brit. p. 423, suppl. pl. 23, f. 3.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 198 (in part).—FLEMING, Brit. Animals, p. 261.

Helix globularis, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 507.
Monacha sericea, Fitzing. Syst. Verz. Erzh. Weichth. p. 95.
Fruticola, „ Held, Isis, 1837, p. 914.
Helix granulata, Alder, Trans. Nat. Hist. Soc. Northumberl. vol. i. p. 39; vol. ii. p. 340.—Gray, Manual L. and F. W. Shells, p. 151, pl. 3, f. 29.—Brown, Illust. Conch. G. B. p. 48.
„ *sericea, var.* Chemn. (ed. Küst.) Conch. Cab. Helix, pl. 99, f. 16, 17, 18.

Shell small, decidedly thin, transparent, subglobose, rather shining, of a more or less pallid fulvous horn-colour, everywhere densely clothed with very delicate down-like hairs, which when partially abraded cause the surface to appear somewhat shagreened or granular, very faintly and irregularly striated. Spire rather elevated, being only about a third less high than the body; apex rather blunt. Whorls five or six rounded, rather quickly but not abruptly enlarging, tolerably broad; the last well rounded at the circumference, devoid of any pale band. Aperture crescent-shaped or abbreviatedly lunate, broader than high, nearly equal in width to half the total diameter, not produced at the base greatly beyond the general level. Outer lip acute, very slightly ribbed internally with white; columellar lip dilated and somewhat reflected over the very small umbilicus. Base rounded. Diameter nearly the third of an inch.

The animal is pale yellowish white, grey about the head and tentacula. The mantle is speckled with black, giving a peculiar mottled aspect to the shell.

This species is widely distributed, but rather local. We have found it most abundant in the neighbourhood of wet, mossy rocks. It is perhaps more frequent in the west and south than elsewhere.

H. LAMELLATA, Jeffreys.

Minute, conoid-globose, with longitudinal membranaceous lamellæ that are not spinous; mouth lunate.

Plate CXVII. fig. 8, 9.

Helix lamellata, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 333, 507. — GRAY, Manual L. and F. W. Shells, p. 150, pl. 5, f. 48.—THOMPSON, Ann. Nat. Hist. vol. vi. p. 26.—MACGILLIVRAY, Moll. Aberd. p. 86.—BROWN, Illust. Conch. G. B. p. 47.—CHEMN. (ed. Küst.) Conch. Cab. Helix, no. 179, pl. 33, f. 13, 14.—L. PFEIF. Monog. Helic. vol. i. p. 51.

„ *Scarburgensis*, BEAN, MSS. cited by ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 36, Mag. Zool. and Bot. vol. ii.—TURT. Manual L. and F. W. Shells, p. 62, f. 48. — ALDER, p. 189.—A. MÜLLER, Wiegm. Arch. Naturg. 1838, pt. 1, p. 208, pl. 4, f. 4.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. viii. p. 37.

„ *seminulum*, ROSSMÄSSL. Iconog. Land und Süssw. Moll. f. 533.

Shell minute, conoid-globose, nearly as high as broad, thin, a little transparent, not polished, but usually with a satin-like gloss, of an uniform pale yellowish horn-colour; adorned with rather close and numerous longitudinal membranaceous laminæ, which do not shoot into spinous processes. Spire raised, about the same height as the body-whorl; apex rather blunt. Volutions five or six, well rounded, strongly defined, gradually and not abruptly enlarging. Aperture depressed, narrow crescent-shaped, not projecting much beyond the preceding whorl, broader than high, scarcely equal to half the total diameter. Peristome thin, simple (destitute of an internal rib), not reflected except very slightly upon the pillar lip. Base tumid, rather suddenly shelving in the middle round the deep but small umbilicus. Diameter the tenth of an inch.

The animal is pale grey.

This curious little snail was formerly supposed to be peculiar to Britain, though now, however, proved to be a German species also. It lives among moss in woods, and is most abundant in the north of England. It is widely distributed in Ireland.

H. ACULEATA, Müller.

Minute, with oblique longitudinal membranaceous lamellæ, that project in a series of prickles around the lower volutions: mouth about as high as it is wide.

Plate CXVII. fig. 5, 6.

Helix aculeata, Müller, Hist. Verm. pt. 2, p. 81.—Fleming, Brit. Animals, p. 262.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 332, 507.—Gray, Manual L. and F. W. Shells, p. 149, pl. 4, f. 33.—Thompson, Ann. Nat. Hist. vol. vi. p. 25.—Macgilliv. Moll. Aberd. p. 86.—Brown, Illust. Conch. G. B, p. 47, pl. 17, f. 1.—Drap. Moll. Ter. et Fluv. France, p. 82, pl. 7, f. 10, 11.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 3, p. 24, pl. 4, f. 24, 25.—Lam. (ed. Desh.) vol. viii. p. 79.—Rossmässl. Iconog. Land und Süssaw. Moll. pt. 8, p. 38, f. 536.—Dupuy, Moll. du Gers, p. 15.—Morelet, Moll. Ter. et. Fluv. Portugal, p. 72.—Chemn. (ed. Küst.) Helix, no. 178, pl. 33, f. 11, 12.—Pfeif. Monog. Helic. vol. i. p. 50.

„ *spinulosa*, Lightfoot, Philosoph. Trans. 1786, p. 166, pl. 2, lower compartm.—Mont. Test. Brit. p. 429, pl. 11, f. 10.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 201.—Dorset Catalog. p. 54, pl. 19, f. 23.—Turt. Conch. Diction. p. 55; Manual L. and F. W. Shells, p. 43, f. 33.—Index Testaceolog. pl. 33, f. 69.

Trochus terrestris, *var.* Da Costa, Brit. Conch. p. 36, probably.

Teba spinulosa, Leach, MSS. (cited by Turton, &c.)

„ *Granatelli*, Bivon. (filius) in Occhio 1839, no. 9, f. 2.

Tuticola aculeata, Held, Isis, 1837, p. 914.

Shell minute, globose-turbinate, thin, semitransparent, not lustrous, of an uniform yellow or brownish horn-colour, covered with an epidermis, which rises upon the lower whorls in regular obliquely longitudinal riblike laminæ, which shoot out above into somewhat lanceolate or spinous foliations, cresting, as it were, the upper portion of the middle of the whorls with a spiral row of membranaceous prickles. Volutions four, rather broad, not rapidly increasing, ventricose, much elevated, deeply separated. Spire raised. Aperture rounded, of nearly equal width and height, about equal to half the basal diameter, produced below beyond the general level of the base. Peristome very thin and acute (an internal rib in aged individuals only), slightly expanded, only reflected at the columella. Base rounded; with a moderately large and deep umbilicus. Diameter about the tenth of an inch.

The animal is bluish or greenish grey, darkest on head and neck.

Of all our minute species this is the most singular and beautiful. It lives among moss in woods, and is widely distributed through the British isles.

H. FULVA, Müller.

Trochiform, minute, smooth, almost imperforated.

Plate CXVIII. fig. 809.

Helix fulva, MÜLLER, Hist. Verm. pt. 2, p. 56. ?—TURT. Manual L. and F. W. Shells, p. 61, f. 47.—GRAY, Manual L. and F. W. Shells, p. 148, pl. 5, f. 47.—BROWN, Illust. Conch. G. B. p. 46, pl. 17, f. 2.—DRAP. Moll. Ter. et Fluv. France, p. 81, pl. 7, f. 12, 13.—C. PFEIF. Deutsch. Land. und Süssw. Moll. pt. 1, p. 23, pl. 2, f. 2.—LAM (ed. Desh.) vol. viii. p. 78.—KRYNICKI, Bull. Soc. Nat. Moscou, vol. ix. p. 167.—ROSSMÄSSL. Iconog. and Süssw. Moll. pt. 8, p. 38, f. 535.—DUPUY, Moll. du Gers, p. 15.—MORELET, Moll. Ter. et Fluv. Portugal, p. 72.—CHEMN. (ed. Küst.) Conch. Cab. Helix, no. 212, pl. 30, f. 22, 23, 24.—L. PFEIF. Monog. Helic. vol. i. p. 30.

Trochus terrestris Listeri or var. a, DA COSTA, Brit. Conch. p. 35, probably.

Helix trochiformis, MONT. Test. Brit. p. 427, pl. 11, f. 9.—TURT. Conch. Diction. p. 54.—MATON and RACK, Trans. Linn. Soc. vol. viii. p. 200.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 331, 507.

„ *nitidula*, ALTEN, Erd u. Flusskonch. Augsburg, p. 53, pl. 4, f. 8.

„ *trochulus*, DILLW. Recent Shells, vol. ii. p. 916.—MACGILLIV. Moll. Aberd. p. 85.

Helix chersina, Say, Journ. Acad. Sc. Nat. Philadelph. vol. ii. p. 156.—Binney, Boston Journ. Nat. Hist. vol. iii. p. 416, pl. 26, f. 3.—Gould, Invert. Massach. p. 185, f. 105.
„ *trochilus*, Fleming, Brit. Animals, p. 260.
„ *Mortoni*, Jeffreys, Trans. Lin. Soc. vol. xvi. p. 332, 507.
„ *Mandralisci*, Bivon (filius) in Giorn. lett. no. 198, f. 6.
Cornulus fulvus, Fitzinger, Syst. Verz. Erzh. Weichth. p. 94.
Polita fulva, Held, Isis, 1837, p. 916.
Petasia trochiformis, Beck, Index Moll. Mus. Christ. Frid. p. 41.

Minute, globose-turbinate, thin, pellucid, glossy, all but perfectly smooth, not downy, of an uniform brownish or yellowish horn-colour; whorls six, convex, very narrow, well defined; spire in the typical form elevated (in the variety *Mortoni* it is depressed, both sides being there of nearly equal convexity); apex rather obtuse. Base prominent in surface, yet slightly flattened, with a minute incipient umbilicus in the young, which is entirely concealed by the reflection of the columella in the adult. Aperture narrow, depressed lunar, ordinarily equal to half the basal diameter; peristome acute, simple, not reflected, except upon the columellar lip. Diameter nearly the sixth of an inch. Beneath a very powerful lens, the base of this tiny shell exhibits most exquisitely fine spiral striolæ. A smaller and darker variety, in which this sculpture is more than usually distinct, has been indicated by Mr. Alder. Generally speaking the more humid is the habitat, the darker and more lustrous will the specimens prove.

The animal is grey.

It inhabits woods among moss, and is widely diffused.*

---

* The *Trochus terrestris* of Pennant (Brit. Zool. ed. 4, vol. iv. p. 128, pl. 80, f. 108, copied Brown, Ill. Conch. G. B. pl. 14, f. 80, 81, the *T. terrestris tertius of* Da Costa Brit. Conch. p. 36) appears to us to be a rude representation of this species, but has been referred by some to the *Carocolla elegans* of Lamarck, which is a native of Southern Europe.

H. fusca, Montagu.

Depressed subglobular, almost imperforated, not minute, transparent, umber-coloured, wrinkled; outer lip acute.

Plate CXIX. fig. 4, 5, and (Animal) Plate G.G.G. fig. 4.

Helix fusca, Mont. Test. Brit. p. 424, pl. 13, f. 1.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 209. — Turt. Conch. Diction. p. 61.— Fleming, Brit. Anim. p. 264. — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 331, 391, 507.—Turt. Manual L. and F. W. Shells, f. 36.—Gray, Manual L. and F. W. Shells, p. 147, pl. 4, f. 36.— Thompson, Ann. Nat. Hist. vol. vi. p. 24. — Brown, Illust. Conch. G. B. p. 47, pl. 17, f. 25, 26. — Wood, Index Testac. pl. 34, f. 132. — L. Pfeif. Symb. Helic. pt. 2, p. 28. — Chemn. (ed. Küst.) Conch. Cab. Helix, no. 204, pl. 29, f. 17, 18, 19. — L. Pfeif. Monog. Helic. vol. i. p. 33.

,, *subrufescens*, Miller, Ann. Phil. New Series, vol. iii. (1822) p. 379 (fide Gray).—Fleming, Brit. Animals, p. 259 (from Miller).

Zonites fuscus, Macgilliv. Moll. Aberd. p. 93.

Shell rather small, extremely thin, almost membranaceous, of an uniform shining and transparent amber colour, not opaque underneath, of a depressed subglobose shape, adorned with longitudinal foldlike wrinkles. Spire a little elevated; apex rather blunt. Whorls five, convex, rapidly enlarging; the last swollen, obscurely subangulated at the circumference, not deflected. Aperture rather large, crescent-shaped, decidedly broader than high, more than equal in width to half the total diameter, occupying half at least of the entire length. Peristome arcuated above and below, thin, simple, not reflected, except upon the short and somewhat perpendicular columella. Base rounded, not distinctly performed.

Diameter scarcely three-eighths of an inch.

The animal is pale yellowish grey, with bluish tentacles; a pale dusky line runs from each tentacle on the neck, but soon fades. There is a bluish purple line across the forehead. The upper tentacles are rather long; the foot is bulky, rapidly declining and acute behind, scarcely exceeding the shell. The whole surface of the body is granulated; there is no separate central row of granules upon the neck.

So far as known this well marked and delicate snail is peculiar to the British islands. It is found in bushy places in many parts of England and Ireland, often creeping upon brambles.

H. PULCHELLA, Müller.

Minute, depressed, white; mouth nearly circular; its edge flatly reflected.

Plate CXIX. fig. 8, 9, 10.

Helix pulchella, MÜLLER. Hist. Verm. Ter. et Fluv. vol. ii. p. 30.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 343.—TURT. Manual L. and F. W. Shells, p. 63, f. 49.—FORBES, Malacol. Monensis, p. 9.—GRAY, Manual L. and F. W. Shells, p. 141, pl. 5, f. 49. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 23.—MACGILLIV. Moll. Aberd. p. 87.—BROWN, Illust. Conch. G. B. p. 45, pl. 14, f. 76.—DRAP. Moll. Ter. et Fluv. France, p. 112, pl. 7, f. 30 to 34.—LAM. Anim. s. vert. (ed. Desh.) vol. viii. p. 76.—C. PFEIF. Deutsch. Land und Süsswas. Moll. vol. i. p. 43, pl. 2, f. 32.—KRYNICKI, Bull. Soc. Nat. Moscou, vol. ix. p. 174. —CHARPENT. N. Denks. Schweiz. Ges. Nat. vol. i. (1837) p. 8 (Chilostoma).—DESH. in Fer. Hist. Moll. p. 21, pl. 69, E. f. 12 to 17. — BINNEY, Boston Jl. of Nat. Hist. vol. iii. p. 375, pl. 9, f. 2. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 7, p. 5, 6, f. 439, 440.—GOULD, Invert. Massachus. p. 176, f. 102.—C. PFEIF. Monog. Helic. vol. i. p. 365.

.. *costata*, MÜLLER, Verm. Ter. et Fluv. vol. ii. p. 31.—FLEMING, Brit. Anim. p. 263.—C. PFEIF. Deutsch. Land und Süssw. Moll. vol. i. p. 43, pl. 2, f. 31.—L. PFEIF. Monog. Helic. vol. i. p. 366.

,, *paludosa*, WALKER, Test. Minut. Rar. f. 23.—MONT. Test. Brit. p. 440. MATON and RACK. Trans. Linn. Soc. vol. viii. p. 193, pl. 5, f. 5.

,, *crenella*, MONT. Test. Brit. p. 441, pl. 13, f. 3. — BROWN, Illust. Conch. G. B. p. 45, pl. 14, f. 78, 79.

,, *mnuta*, SAY, Jl. Acad. Philadelph. vol. i. p. 123.

,, *crystallina*, DILLW. Recent Shells, vol. ii. p. 909.

Turbo Helicinus, LIGHTFOOT, Philosoph. Trans. vol. lxxvi. (1786) p. 167, pl. 3, upper compartment.—DA COSTA, Brit. Conch. p. 59.

Turbo paludosus, Dorset Catalog. p. 52, pl. 19, f. 25.—Turt. Conch. Diction. p. 228.
Chilostoma pulchellum, FITZING Syst. Verz. Erzh. Weichth. p. 98.
Corneola pulchella, HELD, Isis, 1837, p. 912.—WALKER, Testacea minuta rariora, f. 23.
Circinaria pulchella, BECK, Index Moll. Mus. Christ. Frid. p. 23.

Shell minute, suborbicular, rather depressed, tolerably strong for its size, not very transparent, white or corneous white, not variegated or banded, either smooth or with longitudinal membranaceous costella. Spire scarcely at all raised; apex blunt. Whorls three and a half, moderately convex, profoundly defined through their rather abrupt inflection at the suture, not particularly narrow, for the most part gradually enlarging, but rather abruptly dilated at the termination of the last whorl, which is well rounded at its circumference, not distinctly or only slightly deflected. Aperture almost circular, as high as it is broad, margined by a broad and flattened solid opaque white peristome, which is expanded above and reflected below; lips contiguous, not free all round, but connected on the columella by a layer of white shelly matter. Base rounded; umbilicus large, exposing the upper volutions.

Diameter the ninth of an inch. With every disposition to defer to the authority of the illustrious Pfeiffer, whose knowledge of the *Helices* is most comprehensive, we are unable to discern any permanent characters by which the ribbed variety may be distinguished from the smooth one, so as to maintain its position as a distinct species, in which light it has been regarded by Müller and others.

The animal is milky white.

It lives under stones, on walls, and on the ground, often in dampish places. It is very generally diffused throughout the British Isles. Both varieties inhabit wet and dry localities indifferently.

H. rotundata, Müller.

Flattish, with crowded costellar striæ, for the most part radiatingly spotted with chestnut; umbilical opening peculiarly large; mouth lunate.

Plate CXIX. fig. 6, 7, and (Animal) Plate G.G.G. fig. 2.

Helix rotundata, Müller, Hist. Verm. pt. 2, p. 29. — Turt. Conch. Diction. p. 53.—Fleming, Brit. Anim. p. 260.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 342, 511. — Thompson, Ann. Nat. Hist. vol. vi. p. 30.—Brown, Illust. Conch. G. B. p. 51, pl. 17, f. 14, 18, 19, 20, 24.—Drap. Moll. Ter. et Fluv. France, p. 114, pl. 8, f. 4 to 7.—Férus. Prodr. 196; Hist. Moll. Ter. et Fluv. pl. 79, f. 2, 3, 4 (Helicella).—Lam. (ed. Desh.) vol. viii. p. 74.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 44, pl. 2, f. 33, 34.—Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. (1837) p. 12 (Delomphalus). — Krynicki, Bull. Soc. Nat. Moscou, vol. ix. p. 210. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 7, p. 13, f. 454. — Morelet, Moll. Ter. et Fluv. Portugal, p. 55. — Chemn. (ed. Küst.) Helix, no. 153, pl. 24, f. 14, 15, 16. — L. Pfeif. Monog. Helic. vol. i. p. 105.

,, *radiata*, Da Costa, Brit. Conch. p. 57, pl. 4, f. 15, 16. — Mont. Test. Brit. p. 432, pl. 24, f. 3.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 199. — Dorset Catalog. p. 54, pl. 20, f. 15, 16. — Turt. Conch. Diction. p. 53.—Manual L. and F. W. Shells, p. 59, f. 44.—Index Testaceolog. pl. 32. f. 11.

,, *Turtoni*, Fleming, Brit. Animals, p. 260.

Discus rotundatus, Fitzing. Syst. Verz. Erzh. Weichth. Oester. p. 99.

Patula rotundata, Held, Isis, 1837, p. 916.

Euryomphala rotundata, Beck, Index Moll. Mus. Christ. Frid. p. 9.

Zonites rotundatus, Gray, Manual L. and F. W. Shells, p. 165, pl. 5, f. 44.—Macgilliv. Moll. Aberd. p. 88.

Shell small, depressed, nearly equally convex on both sides, not polished, thin, semitransparent, yellowish horn-colour or reddish grey, so alternating with chestnut as to present the appearance of numerous narrow ray-like streaks of the latter hue diverging from the central axis; longitudinally sculptured throughout with crowded but strong and regular costellar striæ. Whorls narrow, from five to six and a half, of very gradual increase, depressed, deeply defined, the last somewhat angulated, but not particularly deflected. Spire merely convex. Aperture small, usually occupying two-fifths of the base, rather depressed, but nearly as high as it is broad, lunate. Peristome simple, acute, not reflected. Base convex, excavated by an extremely large and profound umbilicus which exhibits the superior volutions.

The spire in the variety *Turtoni* is quite flattened. A transparent and colourless variety is occasionally, though rarely, to be met with.

Ordinary diameter a quarter of an inch.

The animal is bluish, with dusky neck and tentacles. Up the sides of each upper tentacle runs a dusky line fading away on the neck. The foot is short behind, tapering and not truncated at the end. The relations of this animal are with the typical *Helices*, and not with the group *Zonites*.

This species is found under stones abundantly in all parts of the British Isles.

H. UMBILICATA, Montagu.

Small, dark brown, unpolished, merely wrinkled; whorls five, of slow increase; umbilicus large; mouth small; outer lip acute.

Plate CXXI. fig. 7, 8.

Helix umbilicata, MONT. Test. Brit. p. 434, pl. 13, f. 2. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 200.—Dorset Catalog. p. 54, pl. 19, f. 24. — TURT. Conch. Diction. p. 54. — FLEMING, Brit. Anim. p. 262 (not note). — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 342. —THOMPSON, Ann. Nat. Hist. vol. vi. p. 31.—BROWN, Illust. Conch. G. B. p. 51.

„ *rupestris*, CHEMN. (ed. Küst.) Conch. Cab. pl. 89, f. 32 to 35, 40 to 43.—PFEIF. Monog. Helic. vol. i. p. 86.—DRAPARN. Moll. Terr. et Fluv. France, p. 82, pl. 7, f. 7, 8, 9.—FÉRUS. Prodrom. 201; Hist. Moll. Terr. et Fluv. pl. 80, f. 2, 3.—TURT. Manual L. and F. W. Shells, p. 60, f. 45. — LAM. (ed. Desh.) Anim. s.

Vert. vol. viii. p. 79.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 3, p. 22, pl. 4, f. 22, 23.—HARTM. in Sturm's Deutsch. Fauna, sect. 6, pt. 8, pl. 2.—ROSSMÄSSL. Iconog. L. und Süssw. Moll. pt. 8, p. 38, f. 534.—MORELET, Moll. Ter. et Fluv. Portugal, p. 72.

Turbo Myrmecidis, SCACCHI, Osserv. Zool. vol. i. p. 11 (teste Philippi).
Zonites umbilicatus, GRAY, Manual L. and F. W. Shells, p. 166, pl. 5, f. 45.
Pyramidula rupestris, FITZING. Syst. Verz. Erzh. Weichth. p. 95.
Patula rupestris, HELD in Isis, 1837, p. 916.
Euryomphala umbilicata, and *rupestris*, BECK, Index Moll. Mus. Christ. Frid. p. 9.
Delomphalus rupestris, HARTM. Erd und Süssw. Gast. i. p. 120, pl. 37, f. 1, 2, 3.
,, *saxatilis*, HARTM. Erd und Süssw. Gast. i. p. 122, pl. 37, f. 4, 5, 6.
Helix spirula, VILLA, Dispos. Syst. Conch. p. 56.
,, *aliena*, ZIEGL. in Pfeif. Symbolæ, pt. 1, p. 39.

Minute, depressed-turbinate, rather thin, slightly pellucid, not polished, of an uniform dark umber-brown, or reddish-chocolate colour, with concentric rugose striulæ. Whorls nearly five, convex, profoundly defined, of gradual increase; the last not suddenly deflexed. Spire but little elevated, apex rather obtuse. Base rounded, with a rather large and very profound funnel-shaped umbilicus. Aperture small, not usually much exceeding one-third of the basal diameter, rather broader than high, somewhat rounded; peristome simple, acute, not reflected.

At most the tenth of an inch in diameter; its height varies owing to the spire being capable of greater or lesser elevation.

The animal is dusky, and nearly black upon the head and tentacles.

It is abundant in many localities on the faces of rocks and walls, or under stones in dry places. It shows a preference for calcareous soils, but is not confined to them, and delights in crawling upon lofty and exposed places, as long ago observed by Montagu.

H. pygmæa, Draparnaud.

Resembling the last, but minute, paler, more transparent, more depressed, composed of four turns at most; the mouth less circular.

Plate CXXI. fig. 9, 10.

Helix pygmæa, Drap. Moll. Terr. et Fluv. France, p. 114, pl. 8, f. 8, 9, 10. — Gray, Medical Repository, 1821, p. 239 (not described). — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 343.—Turt. Manual L. and F. W. Shells, p. 61, f. 46.—Brown, Illust. Conch. G. B. p. 51, pl. 18, f. 48*, 49.— Férus. Prodr. Moll. no. 200; Hist. Moll. Terr. et Fluv. pl. 80, f. 1 (Helicella).—Lam. (ed. Desh.) vol. viii. p. 86.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 3, p. 21, pl. 4, f. 20, 21. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. (1837) p. 12 (Delomphalus). — Rossmässl. Iconog. Land und Süsswas. Moll. pt. 8, p. 37, f. 532. — Morelet, Moll. Ter. et Fluv. Portugal, p. 55. — Chemn. (ed. Kust.) Conch. Cab. Helix, no. 564, pl. 89, f. 24 to 27.—L. Pfeif. Monog. Helic. vol. i. p. 97.

" *minuta*, Studer in Coxe, Travels.

" *Kirbii*, Sheppard, Trans. Linn. Soc. vol. xiv. p. 163 (probably).—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 512.

Discus pygmæus, Fitzing. Syst. Verz. Erzh. Weichth. p. 99.

Patula pygmæa, Held, Isis, 1837, p. 916.

Euryomphala pygmæa, Beck, Index Moll. Mus. Christ. Frid. p. 9.

Zonites pygmæus, Gray, Manual L. and F. W. Shells, p. 167, pl. 5, f. 46. — Macgilliv. Moll. Aberd. p. 323.

Shell very minute, convex, thin, of an uniform pale and hardly transparent brownish horn-colour, with extremely delicate, but regular, longitudinal striæ, of a silky gloss; spire very short and small, the convexity being equal on both sides of the shell; apex blunt. Whorls three and a half to four, moderately broad, not rapidly increasing, deeply defined, convex. Aperture rather small, roundish, crescent-shaped, about equal in width to two-fifths of the total diameter, almost, if not quite, as high as it is broad. Peristome thin, simple, not reflected. Base much rounded; umbilicus large and profound.

Diameter less than one line. Distinguishable from *umbilicata* by its greater depression, lesser number of volutions, and by its less circular aperture.

The animal is paler than the last.

It inhabits wet places among dead leaves in ditches and by springs, and is consequently often overlooked on account of its minuteness. It has been observed in many localities in all three kingdoms, and diffused in such a way that we cannot doubt of its being really a common shell.

Mr. Jeffreys, who has bestowed peculiar attention upon the extremely obscure species of Walker and Adams, considers the three following to be the fry of shells belonging to this genus: the fourth, likewise, is supposed by Montagu to be the fry of a land shell.

Helix resupinata, WALK. Test. Min. Rar. f. 24, from which MONT. Test. Br. 444, MAT. and RACK. Trans. Linn. Soc. vol. viii. p. 203, TURT. Conch. Diction. p. 57.—*Turbo resupinata*, FLEMING, Brit. Anim. p. 300.—*Delphinoidea resupinata*, BROWN, Ill. Conch. G. B. p. 20, pl. 8, f. 45, 47.

,, *globosa*, WALK. Test. Min. Rar. f. 25, from which MONT. Test. Brit. p. 444, MAT. and RACK. Trans. Linn. vol. viii. p. 203.—Turt. Conch. Diction. p. 57.—*Turbo globosus*, FLEMING, Brit. Anim. p. 300.—*Spira globosa*, BROWN, Ill. Conch. G. B. p. 20, pl. 8, f. 34, 37.

,, *reticulata*, WALK. Test. Min. Rar. f. 26, from which MONT. Test. Brit. p. 444, MAT. and RACK. Trans. Linn. vol. viii. p. 203, TURT. Conch. Diction. p. 57.—*Turbo reticulatus*, FLEM. Brit. Anim. p. 300. —*Spira reticulata*, BROWN, Ill. Conch. G. B. p. 20, pl. 8, f. 38, 39.

,, *coarctata*, WALK. Test. Min. Rar. pl. 1, f. 30, from which MONT. Test. Brit. p. 444; MAT. and RACK. Trans. Linn. vol. viii. p. 204; TURT. Conch. Diction. p. 57.—*Turbo coarctata*, FLEM. Brit. Anim. p. 300. — *Spira coarctata*, BROWN, Ill. Conch. G. B. p. 20, pl. 8, f. 43, 52.

SPURIOUS.

H. TERRESTRIS, Chemnitz.

Trochus terrestris, CHEMN. Conch. Cab. vol. ix. pl. 122, f. 1045.—DONOV. Brit. Shells, vol. iv. pl. 111.—MONT. Test. Brit. p. 287.—MATON and RACK. Trans. Lin. Soc. vol. viii. p. 157.—TURT. Conch. Diction. p. 55.

Helix elegans, GMEL. Syst. Nat. p. 3642.—FLEMING. Brit. Anim. p. 260.—ROSSMÄSSL Iconog. L. and F. Moll. pt. 6, f. 345, 346.—L. PFEIF. Monog. Helic. vol. i. p. 179.

A native of Southern Europe and Northern Africa, which Donovan figured, because he considered it identical with the terrestris *of Pennant. This last we believe to have been intended for the* fulva *of our work.*

H. LIMBATA, Férussac.

Helix limbata, FÉRUS. Prodr. Moll. no. 253 (Helicella).—ALDER, Mag. Zool. and Bot. vol. ii. p. 106.—GRAY, Manual L. and P. W. Shells, p. 143, pl. 11, f. 132.—BROWN, Illust. Conch. G. B. p. 46, pl. 18, f. 29, 30.—LAM. (ed. Desh.) Anim. s. Vert. vol. viii. p. 88.—ROSMÄSSL. Iconog. Land und Süsswas. Moll. pt. 6, p. 35, f. 362.—DUPUY, Moll. du Gers, p. 16.—CHEMN. (ed. Küst.) Conch. Cab. Helix no. 94, pl. 17, f. 15, 16.—L. PFEIF. Monog. Helic. vol. i. p. 139.

Fruticola „ HELD, Isis, 1837, p. 914.

Bradybaena „ BECK, Index Moll. Mus. Christ. Frid. p. 18.

A continental species published as indigenous on the authority of Sowerby; who had taken specimens near Hampstead. The species, though sought for, has not again been found, and its discoverer believes it must have been accidentally introduced with foreign plants.

BULIMUS. Scopoli.

Shell spiral, produced, oblong, ovate or turreted; smooth or rough, not shining or glassy; aperture entire, longitudinal ovate, simple or toothed; columella entire; peristome simple or expanded.

Animal exactly similar to that of *Helix*, and having a similar dentition.

The large and beautiful assemblage of land-shells included under the genus *Bulimus* is separated from *Helix* more on account of general habit than because of possessing distinctive characters of much importance. Our few British species, all of small size and ordinary aspect, are easily enough distinguished generically, but among exotic forms there are many, the true position of which, whether in *Bulimus* or in *Helix*, is a matter of doubt. The distribution of the *Bulimi* has been made the subject of a valuable and interesting memoir by Mr. Lovell Reeve.

B. acutus, Müller.

Turreted-conical, white or clear brown, often with dark markings. Body whorl comparatively short.

Plate CXXVIII. fig. 5, and (animal) Plate G.G.G. fig. 6.

Helix barbara, Linn. Syst. Nat. ed. 12, p. 1241 (probably).
,, *acuta*, Müller, Verm. Hist. pt. 2, p. 100.—Gmelin, Syst. Nat. p. 3660.—Dillw. Recent Shells, vol. ii. p. 956.—Férus. Prodrom. Moll. p. 378 (Cochlicella).
Turbo fasciatus, Pennant. Brit. Zool. ed. 4, vol. iv. p. 131, pl. 82, f. 119.—Da Costa, Brit. Conch. p. 91.—Mont. Test. Brit. p. 346, pl. 22, f. 1.
Helix cretacea, Chemn. Conch. Cab. vol. ix. pt. 2, p. 190, pl. 136, f. 1263.
Bulimus acutus, Brug. Encycl. Meth. vol. i. p. 323.—Fleming, Brit. Anim. p. 265.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 346.—Gray, Manual L. and F. W. Shells, p. 185, pl. 6, f. 67.—

Thompson, Ann. Nat. Hist. vol. vi. p. 110.—Couch, Cornish Fauna, pt. 2, p. 49. — Brown, Illust. Conch. G. B. p. 37, pl. 14, f. 18.—Drap. Moll. Ter. et Fluv. France, p. 77, pl. 4. f. 29, 30.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 234. —C. Pfeif. Deutsche Land und Süssw. Moll. pt. 3, p. 35, pl. 7, f. 1.—Philippi, Moll. Sicil. vol. i. p. 140; vol. ii. p. 112.—Rossmässl. Icon. Land und Süssw. Moll. pt. 6, p. 41, f. 378. — Cantraine, Malac. Med. p. 134. — Küster, Chemn. Conch. p. 31, pl. 11, f. 9 to 12.—Morelet, Moll. Portugal, p. 73.—L. Pfeif. Monog. Helic. vol. ii. p. 214.

Bulimus articulatus, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 234.— Deles. Rec. Coquilles, pl. 28, f. 8.

„ *turritella*, Andrz, Krynicki in Bull. Soc. Nat. Moscou, vol. vi. p. 415.

Turbo turricula Maroccana, Chemn. Conch. Cab. vol. xi. p. 280, pl. 209, f. 2063, 2064.

Helix bifasciata, Pulteney, Hutchins, Hist. Dorset, p. 49. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 210. — Dorset Catalog. p. 55, pl. 18, f. 8, 10.—Turt. Conch. Diction. p. 63.—Index Testaceolog. pl. 35, f. 154.

Bulinus variabilis, Hartm. in Sturm Fauna vi. pt. 6, pl. 12; Neue Alpina, vol. i. p. 223.

Cochlicella meridionalis and *turricula*, Risso, Hist. Nat. l'Europe Mérid. vol. iv. p. 78, pl. 3, f. 26.

Bulimus fasciatus, Turt. Manual L. and F. W. Shells, p. 84, f. 67.

Cochlicellus acutus, Beck, Index Moll. Mus. Christ. Frid. p. 63.

Bulimus litoralis, Brumati, Cat. Conch. ter. Monfalc. p. 34, f. 9.

Shell turreted-conical, thin, not polished, at most glossy, very variable in colouring, usually variegated with very numerous longitudinal (often partially confluent) wavy streaks or veins of opaque whitish, and semitransparent brown (either hue preponderating), the latter ranging in tint from pale ash to dark chocolate; sometimes minutely speckled all over with these lines; as frequently as not with an additional narrow brown zone running from the upper corner of the aperture to the lower third of the outer lip, more rarely with an adjacent interrupted band above it, sometimes with a broad band occupying the entire middle portion of the body whorl, and winding along the lower half of the principal smaller volutions; the painting at times, though rarely, almost obsolete. Surface peculiarly and rather irregularly indented lengthways with broad corrugations that correspond in some degree with the coloured markings, so that under a lens, the exterior reminds one of the cutting of a cameo. Whorls nine or ten, of slow longitudinal increase, convex or a little rounded, separated by a well-marked but simple and but little slanting suture, tapering to a much attenuated, yet not acute, apex. Body not filling more than a third of the dorsal length, a little ventricose; its basal declination rounded, and usually more or less abrupt. Mouth devoid of sculpture, of an abbreviated oval or ovate shape, that is well rounded below, and rather suddenly contracted (not gradually peaked) above. Outer lip simple, acute, regularly arcuated throughout. Pillar lip filling more than half the length of the aperture, straightish, and rather broadly reflected above, so as to partially conceal the narrow subumbilicus. Usual length half an inch, with a breadth of two lines and a third, but these dimensions are often exceeded, especially in foreign examples.

Animal stout and rather short, dusky on the head and neck, with darker lines passing to the four tentacula; sides of the body and tail yellowish-white. The posterior extremity does not extend much, if at all, behind the body whorl. There is a dark line down the centre of the forehead. The upper tentacles are rather thick and clavate, the lower ones very short.

This pretty snail is gregarious in its habits, local in its distribution. It is most abundant near the sea, and in the western districts, especially on sandy or limestone soils. Abundant in the Channel Isles and on the waste lands of Dorsetshire (on chalk, Purbeck, Portland stone), Devon, and Cornwall. South and North Wales, Lancashire, the Isle of Man (on sand and limestone, never on slate), parts of the west of Scotland and Hebrides. Local in Ireland, but found from the Giant's Causeway to Youghal; commonest in the eastern districts, and occasionally occurs inland (W. Thompson).

B. LACKHAMENSIS, Montagu.

Elongate-conoid, with a blunt apex, chocolate-brown; surface shagreened.

Plate CXXVIII. fig. 6.

Bulimus montanus, DRAP. Tableau Moll. p. 65; Hist. Moll. Ter. et Fluv. France, p. 74, pl. 4, f. 22.—TURT. Manual L. and F. W. Shells, p. 80, f. 62.—BROWN, Illust. Conch. G. B. p. 36, pl. 14, f. 22, and pl. 18, f. 14.—LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 235.—STURM, Deutsch. Fauna, sect. vi. pt. 3, pl. 6.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 52, pl. 3, f. 10.—ROSSMÄSSL. Icon. Land und Süssw. Moll. pt. 1, p. 86, f. 41, and pt. 6, p. 46, f. 386.—CHARPENT. N. Denks. Schweiz. Ges. Nat. vol. i. p. 14, pl. 2, f. 2 (Bulimulus).—L. PFEIF. Monog. Helic. vol. ii. p. 120.

Helix Lackhamensis, MONT. Test. Brit. p. 394, pl. 11, f. 3.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 212.—TURT. Conch. Diction. p. 64.—DILLW. Recent Shells, vol. ii. p. 953.—Index Testaceolog. pl. 35, f. 148.

„ *sylvestris*, STUDER, in Coxe, Travels (Hartm.).

„ *buccinata*, ALTEN, Erd und Fluss Conch. Augsburg, p. 100, pl. 12, f. 22.

„ *obscura*, SCHRANK, Fauna, iii. 273.

Bulimus obscurus, HARTM. Neue Alpina, vol. i. p. 222.

„ *Montacuti*, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 345, 512.

„ *Lackhamensis*, FLEMING, Brit. Anim. p. 265.—GRAY, Manual L. and F. W. Shells, p. 181, pl. 6, f. 62.

„ „ BECK, Index Moll. Mus. Christ. Frid. p. 71.

Ena montana, LEACH, MSS. (cited by Turton).—HARTM. Erd und Süssw. Gast. vol. i. p. 75, pl. 20.

Shell elongated-conoid, tapering gradually to a blunt apex, rather thin, more or less glossy, somewhat translucent, of an uniform chocolate or brownish hue, very finely, and rather indistinctly, wrinkled lengthways; beneath the lens visibly, though minutely shagreened. Whorls quite seven, simply convex, of rather slow but regular longitudinal increase, profoundly divided by a simple and not much slanting suture. Body filling about two-fifths of the dorsal length; its basal declination rounded but rather abrupt. Mouth unarmed, suboval, being semielliptic below, and obliquely acute above, occupying barely three-eighths of the ventral length, livid or reddish brown, changing to white near the outer edges. Outer lip not very prominent, rather narrowly reflected or expanded, projecting a little at first somewhat obliquely, and without much convexity, then moderately arcuated. Pillar lip broadly reflected, almost perpendicular, filling at least one half the length of the aperture, flanked by a conspicuous umbilical chink. Ordinary length six lines and a half; breadth three lines.

The animal closely resembles that of *Bulimus obscurus*, but is rather paler.

This is one of our rarest and most local land shells. It is found only in the southern counties of England, occurring in limited localities, usually in wooded districts, Essex, Kent, Surrey (Professor Bell finds it at Selborne), Wilts, Somerset, and Gloucestershire.

It is abundant in many districts of Germany, France, and Switzerland.

B. OBSCURUS, Müller.

Yellowish brown; in shape like the last but smaller; surface not shagreened; mouth with white lips.

Plate CXXVIII. fig. 7.

Turbo rupium, DA COSTA, Brit. Conch. p. 90 (from LIST. An. Angl. pl. 2, f. 8, very badly).

Helix obscura, GMELIN, Syst. Nat. p. 3661.—MONT. Test. Brit. p. 391, pl. 22, f. 5. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 212, pl. 5, f. 11.— Dorset Catalog. p. 55, pl. 19, f. 17 (not well). —

Turt. Conch. Diction. p. 64.— Alten, Erd und Fluss. Conch. Augsburg, p. 98, pl. 12, f. 21.—Dillw. Recent Shells, vol. ii. p. 953.

Bulimus obscurus, Drap. Moll. Terr. et Fluv. France, p. 74, pl. 4, f. 23.— Sheppard, Trans. Linn. Soc. vol. xiv. p. 166. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 52, pl. 3, f. 11.— Fleming, Brit. Animals, p. 265.— Jeffreys, Trans. Linn. Soc. vol. xvi. p. 345.—Turt. Manual L. and F. W. Shells, p. 81, f. 63.—Gray, Manual L. and F. W. Shells, p. 183, pl. 6, f. 63.—Thompson, Ann. Nat. Hist. vol. vi. p. 109.— Macgilliv. Moll. Aberd. p. 98. — Brown, Illust. Conch. G. B. p. 36, pl. 18, f. 13, and pl. 14, f. 21. — Rossmässl. Iconog. Land und Süssw. Moll. pl. 6, p. 46, f. 387. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. p. 14, pl. 2, f. 1 (Bulimulus).—Porro, Malac. p. 54.—Morelet, Moll. Portugal, p. 73.—L. Pfeif. Monog. Helic. vol. ii. p. 124.

„ *hordeaceus*, Brug. Encycl. Méth. Vers, vol. i. p. 334.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 236.

Bulinus obscurus, *β*, Hartm. Neue Alpina, vol. i. p. 222; in Sturm's Fauna, sect. vi. pt. 8, pl. 1.

Ena obscura, Leach, MSS. (cited by Turton).—Beck, Amtl. Kiel. 1846, p. 122.

Merdigera obscura, Held, Isis, 1837, p. 917.

Buliminus obscurus, Beck, Index Moll. Mus. Christ. Frid. p. 71.

The shell so closely resembles the preceding as not to require a separate detailed description. It is only, however, about half its size, being usually three lines and a half long, and from a line and three quarters to a line and a half broad. The shape is more cylindraceous, the penult volution being almost equally as wide as the body, so that whilst in *Lackhamensis* the tapering commences from the body, in this species it usually seems to originate from the next turn only. The whorls are decidedly more rounded, and not perceptibly shagreened; the mouth is rather shorter; the lips quite white (not merely blanched at the edge), and the outer one more arched in the middle, and rather more disposed to expand. The external colouring is of an uniform yellowish-brown; but an albino variety is occasionally taken.

The animal is somewhat rugose, dark grey or brownish above, mottled with nearly black irregular spots, which become fainter on the paler sides, where they fall into rows. The sole of the foot is pale grey. The upper tentacles are somewhat clavate, the lower ones short. Professor Macgillivray remarks that when crawling, it carries its shell at an angle of about 50°, and directed backwards a little to the right; when at rest the shell is directed to an angle of 45°. M. Bouchard-Chantereaux remarks that the young of this species do not arrive at their last stage of growth before the first month of their second year.

This *Bulimus* is found under stones, on old walls and ruins, and on trees in woods. It is widely distributed through the British Isles, extending to the north of Scotland. In many districts, however, it is local, and is not unfrequently found chiefly in those parts where there is a limestone soil.

Note.—It is just possible that the obscure and undetermined *Helix stagnorum* of Pulteney (Hutchins, Dorset, p. 49) may be intended for this species; we know not where else to notice it. It is thus described:—"Ovate-oblong, whitish, sometimes brown; about three lines long; subturreted. Volutions six, minutely striated, or rather wrinkled obliquely, in the transverse direction. Aperture ovate, bordered with a white edge. Inhabits plants in moist places by rivers and brooks, and in woods in Dorset."

SPURIOUS.

B. GUADALOUPENSIS, Bruguiere.

Helix exilis, GMELIN, Syst. Nat. p. 3668 (merely from figures).
Bulimus Guadaloupensis, BRUG. Enc. Méth. Vers, vol. i. p. 313.
Helix detrita (not Müller), PULT. Hutchins, Hist. Dorset, p. 49.—MONT. Test. Brit. p. 384.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 217.—RACK. Dorset Catal. p. 56.—TURT. Conch. Diction. p. 66.
Limnea „ FLEMING, Brit. Animals, p. 273.
Bulimus exilis, L. PFEIF. Monog. Helic. vol. ii. p. 223 (and his synonyms).

It is manifest that a great part of the description of the H.

detrita* *of British writers, a shell introduced by Pulteney on the authority of Mr. Bryer, as from a pond in Dorsetshire, was derived from the common West Indian* Bulimus, *figured by Chemnitz (Conch. Cab. vol. ix. f.* 1224*) ; yet the statement that British specimens are not banded, but of a somewhat transparent light horn colour, renders it not improbable that the original specimens, although at the time considered identical with the banded shell, were specifically distinct. Of their spuriousness, however, there can be no doubt.*

The figure in the Dorset Catalogue (pl. 19*) is too rude for recognition, and that of Montagu (pl.* 11, *f.* 1*) is by no means satisfactory; both, however, might pass for* B. Guadaloupensis. *Probably Turton's drawing of his* Limneus detritus *was copied from Montagu's; assuredly it bears not the least resemblance to the shell described by him (not declared to be indigenous, but only purchased for such), which he states to have three brown bands on the first whorl, to have rather tumid volutions, and "in size and figure" to "answer exactly to the* H. Bontia *of Chemnitz" (vol. ix. f.* 1216, 1217.

B. Goodalli, Miller.

Helix Goodalli, Miller, Ann. of Philos. new ser. vol. iii. (1822) p. 381.
Bulimus „ Gray, Ann. Philos. new ser. vol. ix. p. 414; edit. Turt. Man. p. 6, f. 61, as spurious.—Fleming, Brit. Animals, p. 266.—L. Pfeif. Monog. Helic. vol. ii. p. 159 (with synonyms).
„ *clavulus*, Turt. Manual L. and F. W. Shells, p. 79, f. 61. — Alder, Mag. Zool. and Bot. vol. ii. p. 110.

From Guadaloupe, &c.; introduced by Miller, who had found it in some pine-beds at Bristol. It is one of the most widely-distributed of land shells.

B. decollatus, Linnæus.

Helix decollata, Linn. Syst. Nat. ed. 2, p. 1247.
Bulimus decollatus, Brug. Encycl. Méth. Vers, vol. i. p. 326. — Turt. Manual L. and F. W. Shells, p. 77, f. 60.—Fleming, Brit. Anim. p. 266. — L. Pfeif. Monog. Helic. vol. ii. p. 152 (with synonyms).

---

* The *B. detritus* of Pfeiffer's monograph is figured in Kenyon's paper on British Shells, but only as illustrative, not as indigenous. The species was erroneously imagined by Férussac to be the *Helix detrita* of British writers (Gray).

An inhabitant of the South of Europe and Asiatic and African shores of the Mediterranean; introduced into our Fauna by Dr. Turton from the species having bred in a hot-house in South Devon, into which no foreign mould was known to have been admitted; the colony is now extinct.

B. PUPA, Linnæus.

Helix pupa, LINN. Syst. Nat. ed. 12, p. 1248.
Bulimus tuberculatus, TURT. Zool. Journ. vol. ii. p. 363, pl. 13, f. 4; Manual L. and F. W. Shells, p. 81, 142, f. 64.
„ *pupa*, L. PFEIF. Monog. Helic. vol. ii. p. 128 (with synonyms).

A native of Sicily, Greece, Algiers, &c.; introduced by Dr. Turton as from Worcestershire.

B. GUILDINGII, Pfeiffer.

Bulimus articulatus (not of Lamarck), TURT. Manual L. and F. W. Shells, p. 85, f. 68.
Bulinus signatus (not of Wagner in Spix), SOWERBY (as of Guilding), Conch. Illust. Bulim. f. 57.
Bulimus Guildingii, L. PFEIF. Symbolæ, pt. 2, p. 115. — REEVE, Conch. Icon. vol. v. Bul. pl. 64, f. 445.

A West Indian shell, asserted by Turton to have been taken in the vicinity of Penzance, in Cornwall. Mr. J. E. Gray, in his "Introduction" to Turton's Manual, considers it to form but one species with the formosus *and* cylindrus *(which last name has priority); in the recent Monograph of the genus, by Reeve, however, the three shells are figured as distinct.*

B. VENTRICOSUS, Draparnaud.

Bulimus ventricosus (not Bulla ventricosa, Chemn.), DRAPARN. Moll. Ter. et Fluv. France, p. 78, pl. 4, f. 31, 32. — TURT. Manual L. and F. W. Shells, p. 86, f. 69. — GRAY, Manual L. and F. W. Shells, p. 12, f. 69 (as spurious).
„ *ventorsus*, L. PFEIF. Monog. Helic. vol. ii. p. 215 (with synonyms).

A native of the South of France, &c.; introduced into our Fauna by Turton, who evidently mistook a variety of acutus *for it as Cornish. His figure appears to be copied from Draparnaud.*

PUPA, Lamarck.

Shell spiral, produced, cylindrical, terminating abruptly and obtusely; whorls numerous, narrow; mouth oval or lunate in the greater number of species, toothed within; peristome usually reflexed or thickened.

Animal short, stout, acute behind, its upper tentacles developed, its lower ones short or almost obsolete.

The very small dimensions, or rather apparent absence, of the lower tentacles in certain *Pupæ*, led to their being constituted into a genus under the name of *Vertigo*.

Our native species are all small shells, some of them minute.

P. umbilicata, Draparnaud.

Of a shortened cylindrical shape; wrinkles indistinct; peristome broadly and flatly reflected.

Plate CXXIX. fig. 7.

Turbo cylindraceus, Da Costa, Brit. Conch. p. 89, pl. 5, f. 16.

Bulimus muscorum, Brug. Encycl. Méth. Vers, vol. i. p. 334 (partly).

Turbo „ Pult. Hutchins. Dorset, p. 46 (in part).—Donov. Brit. Shells, vol. iii. pl. 80 (probably).—Mont. Test. Brit. p. 335, pl. 22, f. 3.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 182 (in part). — Rack. Dorset Catal. p. 51, pl. 21, f. 16 (probably).—Turt. Conch. Diction. p. 220, f. 73.

Pupa umbilicata, Drap. Tableaux Moll. p. 58; Hist. Moll. Terr. et Fluv. France, p. 62, pl. 3, f. 39, 40.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 356.—Turt. Manual L. and F. W. Shells, p. 97, f. 78.—Gray, Manual L. and F. W. Shells, p. 19, pl. 7, f. 78. — Thompson, Ann. Nat. Hist. vol. vi. p. 111. — Maccilliv. Moll. Aberd. p. 99. — Brown, Illust. Conch. G. B. p. 40, pl. 18*, f. 39, 39*.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 179. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. p. 15. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 5, p. 15, f. 327.— Brumati, Monfalc. p. 38.— Porro, Malac. p. 66.—Cantraine, Malac. Med. p. 143.— Philippi, Moll. Sicil. vol. ii. p. 114. — Dupuy, Moll. du Gers, p. 40. —

Küster, p. 22, pl. 3, f. 10, 11, 12.—Morelet, Moll. Portugal, p. 74.—L. Pfeif. Monog. Helic. vol. ii. p. 329.
Helix umbilicata, Férus. Prodrom. 474 (Cochlodonta).
Pupa muscorum, Fleming, Brit. Anim. p. 268. — Brown, Illust. Conch. G. B. p. 39 (probably), pl. 18*, f. 38, 38*.
Pupilla umbilicata, Beck, Index Moll. Mus. Christ. Frid. p. 84.
Eruca „ Swainson, Malacology, p. 334.
Stomodonta umbilicata, Mermet, Moll. Pyren. p. 53.
Pupa bidentata, Brown, Ill. Conch. G. B. p. 39, pl. 14, f. 6 (probably).

Shell small, oblong-cylindrical, or subcylindrical, but distinctly tapering, thin, somewhat pellucid, pale olivaceous brown, or fulvous horn-coloured, shining, indistinctly striolate, and chiefly so near the sutures. Whorls six or seven, rounded, distinctly though gradually enlarging; the last about equal to two-fifths of the entire length; apex more or less blunt. Aperture obliquely semi-oval, narrowed, and angular below (or anteriorly), usually (there exists an edentulous variety) provided with a laminated or angular tooth closely adjacent to the junction of the outer lip with the body, and often connected with, and subparallel to the former. Peristome broadly and flatly reflected, especially at the columella, unarmed, white or stained with rufous. Columella longer than the space between it and the outer lip. Base compressed, broadly perforated; umbilicus bounded by a kind of rib-like fold. Length the ninth of an inch; breadth the twentieth of an inch. Da Costa, as usual, whilst regarding this species as the *muscorum* of Linnæus, endeavoured to substitute a name of his own selection.

In this species and in *Pupa anglica*, Mr. Alder was first to observe that a spiral ridge or lamina runs around the columella, and another in the centre of the upper side of the whorls, whilst they are crossed by small flat transverse laminæ like rudimentary partitions. The structure is not present in the adult whorls, and has some relation to the young stage of the animal.

The animal is rather stout, with long upper tentacles, and very short but distinct lower ones. Its colour is pale blue, deepening to dark grey on the neck and head. The sides of the foot are steep, and, as well as the sole and tail, very pale and nearly white.

This is the commonest of all our native Pupas, occurring everywhere under stones, among moss, on walls, and about hedges, woods, and sand-banks. It is present in all our provinces and outlying islands, and is found high up on mountains, as well as on low grounds, and on the verge of the sea-shore. It is a widely-distributed species, extending throughout Europe and into the north of Africa.

P. MUSCORUM, Linnæus.

Outer lip margined externally by a strong rib-like callus; teeth parietal, if any.

Plate CXXIX. fig. 8, 9.

Turbo muscorum, LINN. Syst. Nat. ed. 12, p. 1240. — CHEMN. Conch. Cab. vol. ix. p. 61, pl. 123, f. 1076. — DILLW. Recent Shells, vol. ii. p. 878.

Helix „ MÜLLER, Hist. Verm. pt. 2, p. 105. — FÉRUS. Prodr. Moll. p. 475 (Cochlodonta).

Bulimus „ BRUG. Encycl. Méth. Vers, vol. i. p. 334 (partly).

Pupa marginata, DRAP. Tableau Moll. p. 58; Hist. Moll. Ter. et Fluv. de France, p. 61, pl. 3, f. 36 to 38. — FLEMING, Brit. Anim. p. 268.— TURT. Manual L. and F. W. Shells, p. 98, f. 79. — GRAY, Manual L. and F. W. Shells, p. 196, pl. 7, f. 79. — MACGILLIV. Moll. Aberd. p. 99. — BROWN, Illust. Conch. G. B. p. 39, pl. 18, f. 33, 34. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 59, pl. 3, f. 23, 24.

Turbo chrysalis, TURT. Conch. Diction. p. 220.

Pupa muscorum, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 180. — NILLSON, Moll. Sueciæ T. et Fl. p. 49.—C. PFEIF. Deutsch. Land und Sussw. Moll. pt. 1, p. 57, pl. 3, f. 17, 18, and pt. 3, p. 61.— WAGNER, in Chemn. Conch. vol. xii. p. 165, pl. 235, f. 4109 to 4112. — Desh. Encycl. Méth. Vers, vol. ii. p. 405. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 83, f. 37, and pt. 5, f. 323. — Porro, Malac. p. 62. — Dupuy, Moll. du Gers, p. 40. — Küster, p. 12, pl. 2, f. 1 to 5. — L. Pfeif. Monog. Helic. vol. ii. p. 313.

Pupa unidentata, C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 58, pl. 3, f. 19, 20. — Brown, Ill. Conch. G. B. p. 39, pl. 18*, f. 40 (probably). — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. p. 15.

,, *bidentata*, C. Pfeif. Deutsch. Land und Süssw. Moll. pt. i. p. 59, pl. 3, f. 21, 22.

Alæa marginata, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 357. — Sowerby, Conch. Manual, f. 292.

Turbo ,, Sheppard, Trans. Linn. Soc. vol. xiv. p. 155.

Jaminia muscorum, Risso, Hist. Nat. l'Europe Mér. vol. iv. p. 89.

Pupilla marginata, Leach MSS. (cited by Turton).

,, *muscorum*, Beck, Index Moll. Mus. Christ. Frid. p. 84.

Torquatella marginata, Held, Isis, 1837, p. 919.

Stomodonta ,, Mermet, Moll. Pyren. p. 53.

Pupa badia, Adams, Boston Jl. of Nat. Hist. vol. iii. p. 331, pl. 3, f. 18.

Shell cylindrical, small, moderately strong, yellowish brown, or chestnut coloured, not much shining, indistinctly striolated. Whorls six or seven, short, a little rounded, well-defined; body about equal to one-third the entire length; apex blunt. Aperture small, nearly semicircular, with generally a small tubercular denticle (there exists an edentulous variety) deeply seated on the body whorl, about half way between the columellar and the outer lip. Peristome scarcely reflected; outer lip not denticulated, simple, margined externally by a strong white rounded callus or rib. Pillar lip somewhat reflected, with a small subumbilicus lying behind it. Columella for the most part shorter than the inner wall of the aperture.

Length the ninth of an inch; breadth about half a line. The species is recognised as the original *Turbo muscorum* by an examination of specimens in the Linnæan cabinet.

The animal is slenderer than the last, very dark blue black upon the neck, head, and upper tentacles, darker lines running along the back from the latter organ. The sides and tail are white, the lower tentacles are very short, appearing only as prominences.

This *Pupa* is widely distributed, though not quite so general as the last. It has been found in every well-searched district. It is, perhaps, especially prolific on calcareous soils, and lives in similar situations with *P. umbilicata*.

P. ANGLICA, Férussac.

Dextral, not very minute; whorls six or seven, not much rounded; peristome very thick, flatly reflected; mouth with five teeth.

Plate CXXIX. fig. 6.

Vertigo Anglica, FÉRUS. Prodrom. Moll. p. 64. — TURT. Manual L. and F. W. Shells, p. 102, f. 82. — POTIEZ and MICHAUD, Galerie Douai, Moll. vol. i. p. 195, pl. 20, f. 1, 2.

Turbo Anglicus, GRAY, in Index Testac. Suppl. pl. 6, f. 12.

Pupa ringens, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 356, 514.

„ *Anglica*, ALDER, Trans. Nat. Hist. Soc. Northumberl. vol. i. p. 33.—GRAY, Manual Land and F. W. Shells, p. 195, pl. 7, f. 82. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 112. — BROWN, Illust. Conch. G. B. p. 40, pl. 18, f. 35, 36. — MORELET, Moll. Portugal, p. 75.—L. PFEIF. Monog. Helic. vol. ii. p. 351.

Shell small, oblong-cylindraceous, but distinctly tapering above, perforated, moderately strong for its size, obscurely striolate, rather opaque, chocolate brown, with usually a more or less distinct paler band at the base of the body, yet sometimes of an uniform pale horn colour. Whorls six or seven, regularly enlarging but little rounded; the last occupying more than one-third the length of the shell, and compressed at its base in front; suture but little oblique; apex rather obtuse. Aperture resembling in general shape the lobe of the human ear, obtusely rounded, and not much attenuated below; peristome very thick, flatly reflected, more or less tinged with liver colour; the shelly matter between the two lips on the penult whorl very thinly spread. A somewhat tubercular projection on the inner edge of the outer lip, conjointly with a conspicuous curved and remarkably prominent laminar parietal tooth, which is united to the outer lip by a callus, almost isolates a small portion of the aperture; there is a second, but smaller and more deeply-seated parietal lamina, a strong columellar one, a remote inferior palatal one, and a basal denticle, which is very far within the aperture, making in all five teeth.

Length very nearly two lines; breadth not quite half that measurement.

The animal is described by Mr. Alder (who has given an interesting account of the internal structure of its shell in his Memoir on the Land and Fresh-water shells of Northumberland) as being of a dark lead colour above, white below.

This species, though usually regarded as more especially belonging to the North of England districts, is probably a member of our Atlantic fauna, and of southern or south-western origin. Mr. F. D. Lukis finds it in great abundance on the south coast of Guernsey; and Mr. W. Thompson records it as occurring in north, south, east, and west of Ireland, though not general. The same active naturalist has found it in the south-west of Scotland. The naturalists of Newcastle have found it in several localities in the Northumberland district, where it occurs in moss, and under stones, but is scarce. It was first taken in the neighbourhood of Scarborough, by Mr. J. S. Miller.

P. SECALE, Draparnaud.

Not minute, dextral; mouth with seven or eight teeth.

Plate CXXIX. fig. 5.

Pupa secale, DRAP. Tableau Moll. p. 59; Hist. Moll. Terr. et Fluv. France, p. 64, pl. 3, f. 49, 50.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 355.—LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 177. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 55, pl. 3, f. 14. — WAGNER in Chemn. Conch. vol. xii. p. 171, pl. 235, f. 4119. — DESH. Encycl. Méth. vol. ii. p. 401.—KÜSTER, p. 44, pl. 6, f. 3, 4, 5. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 5, p. 13, f. 317. — CHARPENT, N. Denks. Schweiz. Ges. Nat. vol. i. p. 16 (Chondrus).—SOWERBY, Conch. Manual, f. 518.— DUPUY, Moll. du Gers, p. 42. — MORELET, Moll. Portugal, p. 74. — L. PFEIF. Monog. Helic. vol. ii. p. 341.

Turbo juniperi, MONT. Test. Brit. p. 340, pl. 12, f. 12. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 182. — Dorset Catalog. p. 51, pl. 19, f. 11*. — TURT. Conch. Diction. p. 219. — DILLW. Recent Shells, vol. ii. p. 877.

„ *cylindricus*, HARTM. in N. Alpina, vol. ii. p. 212.

Chondrus secale, CUVIER, Règne Anim. (ed. Voigt) vol. iii. p. 89. — HARTM. in Sturm Deutsch. Fauna, sect. vi. pt. 7, pl. 4. — HARTM. in Neue Alpina (var. *a*).

Helix cylindrica, STUDER in Coxe, Travels.

Torquilla secale, STUDER, Verz. Schweiz. Conch. p. 19.—FITZING. Verz. p. 107. —BECK. Index Moll. Mus. Christ. Frid. p. 86.

Helix „ FÉRUS, Prodrom. Moll. 488.

Jaminea „ RISSO. Hist. Nat. l'Europe Mérid. vol. iv. p. 89.

Vertigo „ TURT. Manual L. and F. W. Shells, p. 101, pl. 7, f. 81.

Pupa juniperi, FLEMING. Brit. Anim. p. 268. — GRAY, Manual L. and F. W. Shells, p. 197, pl. 7, f. 81.—BROWN, Illust. Conch. G. B. p. 40, pl. 14, f. 1.

Granaria secale, HELD, Isis, 1837, p. 918.

Stomodonta „ MERMET, Moll. Pyren. p. 51.

Shell subcylindrical, but distinctly attenuated above, of a dull brown, or pale chocolate-brown, but little pellucid; not very thin, with fine oblique longitudinal costellar striæ. Whorls from seven to nine, regularly but very gradually enlarging, the upper ones but little convex, the lower more rounded; last whorl short in proportion, compressed at the base, exhibiting externally near the mouth, in the shape of three or four spiral white lines, the traces of the internal laminæ; apex of the spire not particularly obtuse. Aperture semi-oblong, rounded below, somewhat squared above, not occupying quite one-third the length of the shell, furnished with seven or eight tooth-like folds, of which three are upon the outer lip, with generally a smaller very deep seated one above them, two on the columella, and two are parietal. Of these last, the anterior or lower is the smaller and the deeper seated; whilst the posterior is large, conspicuous, external, adjacent to, and connected by a callus with the outer lip, and often provided with an additional denticle above it. Peristome white, acute, not broadly expanded, but reflected over the umbilical chink.

Length from a quarter to the third of an inch; breadth not much more than a third that measurement.

The animal is rather more elongated than its allies; it is blackish-brown above, pale beneath; the lower tentacles are very short.

This is in the main a southern species, though found in limestone localities throughout a great part of England. It occurs in the Channel Islands, is very abundant on the chalky and limestone districts of the south and west of England, and is plentiful on the limestone of Kendal, in Westmoreland; it is not found in Scotland, nor in Ireland; it is a widely distributed continental shell. When young it invests its shell with mud, a coating which usually, but not always, is dispensed with when it arrives at its full growth.

P. edentula, Draparnaud.

Minute, cylindrical; wrinkles indistinct; mouth toothless; outer lip simple, not reflected.

Plate CXXX. fig. 1.

Pupa edentula, Drap. Moll. Ter. et Fluv. France, p. 59, pl. 3, f. 28, 29. — Alder, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 33. — Fleming, Brit. Anim. p. 269. — Turton, Manual L. and F. W. Shells, p. 99, pl. 7, f. 80. — Charpent. N. Denks, Schweiz. Ges. Nat. p. 15 (Sphyradium).
Helix exigua, Studer, in Coxe, Travels (teste Hartm.)
Vertigo edentula, Studer, Verz. Schweiz. Conch. p. 89.—Gray, Manual L. and F. W. Shells, p. 199, pl. 7, f. 80. — Thompson, Ann. Nat. Hist. vol. vi. p. 113. — Macgilliv. Moll. Aberd. p. 101. — Brown, Illust. Conch. G. B. p. 41, pl. 18, f. 36*.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 3, p. 42, pl. 7, f. 28, 29.—Michaud, Comp. Drap. Moll. France, p. 72.—Porro, Malac. p. 67.—Held, in Isis, 1836, p. 277.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 10, p. 28, f. 646.
„ *nitida*, Férus, Prodrom. Moll. p. 68.
Helix Offtonensis, Sheppard, Trans. Lin. Soc. vol. xiv. p. 155.
Jaminia edentula, Risso, Hist. Nat. l'Europe Mer. vol. iv. p. 89.
Turbo edentulus, Wood, Index Testac. Suppl. pl. 6, Turbo, f. 14 (young).
Alæa nitida and *revoluta*, Jeffreys, Trans. Lin. Soc. vol. xvi. pp. 358, 515.
Vertigo lepidula, Held, in Isis, 1837, p. 307.
Alæa edentula, Beck, Ind. Moll. Mus. Christ. Frid. p. 85.
Stomodonta edentula, Mermet, Moll. Pyren. p. 54.

Shell small, more or less perforated, cylindraceous, but tapering towards the apex, very thin, transparent, glossy, of an uniform horn colour, finely and rather indistinctly wrinkled lengthways. Whorls six or seven, rounded, deeply divided by a but slightly slanting suture, decidedly short, the height being considerably less than half the breadth; antepenult whorl often broader than, and always nearly, if not quite, as wide as the penult mouth, quite as long as it is broad, somewhat quadrant-shaped (the pillar being almost at right angles to the parietal portion of the inner lip), usually not occupying more than a fourth of the entire length, and filling rather more than half the basal width, devoid of any teeth or laminæ. Lips disunited, the outer one more or less arched, not strengthened by any external rib or callosity, neither dilated, nor folded back; pillar lip not much curved, oblique at the edge, broadly reflected above. Length rather more than the tenth of an inch.

The animal is dark grey above, paler beneath; its lower tentacles are almost obsolete.

It is widely diffused, but local, though occurring in the three kingdoms and in the Isle of Man (T. Hincks). It is found chiefly among grass and dead leaves in woods. Mr. C. C. Babington has observed it in great abundance in Lanarkshire on the under surface of the frond of *Aspidia* in autumn (Lowe).

P. MINUTISSIMA, Hartmann.

Minute, cylindrical; with distinct close-set raised wrinkles; mouth edentulous; outer lip scarcely at all reflected.

Plate CXXX. fig. 2.

Pupa muscorum, DRAP. (not Turbo muscorum of Linn.) Tableau Moll. p. 56; Hist. Moll. p. 59, pl. 3, f. 26, 27.—CHARPENT. N. Denks. Schweiz. Ges. Nat. vol. i. p. 15 (Sphyradium).—MORELET, Moll. Ter. et Fl. Portugal, p. 74.

„ *minutissima*, HARTMANN, Neue Alpina, vol. i. p. 220, pl. 2, f. 5. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 3, p. 38, pl. 7, f. 12, 13.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 84, f. 38. — PORRO, Malacol. p. 62. — DESH. in Lam. Anim. s. Vert. vol. viii. p. 189.—DUPUY. Moll. Gers. p. 39. — KÜSTER, pl. 13, f. 27, 28. — L. PFEIF. Monog. Helic. vol. ii. p. 306.

Vertigo cylindrica, FÉRUS. Prodrom. 2.—ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 40; Mag. Zool. and Bot. vol. ii. p. 112.—GRAY, Manual L. and F. W. Shells, p. 200, pl. 12. f. 140. —BROWN, Illust. Conch. G. B. p. 41, pl. 18, f. 38.

Pupa obtusa (not Drap.), FLEMING, Brit. Anim. p. 269.

Alæa cylindrica, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 359.
Vertigo muscorum, Michaud, Comp. Draparn. Moll. France, p. 70.
„ *pupula*, Held, Isis, 1837, p. 308.
Alæa minutissima, Beck, Ind. Moll. Mus. Christ. Frid. p. 85.
Eruca muscorum, Swainson, Malacol. p. 334.
Vertigo minutissima, Graells, Cat. Mollus. Espag. p. 7.
Stomodonta muscorum, Mermet, Moll. Pyren. p. 55.

Shell minute, thin, cylindrical, only slightly lustrous, semitransparent, of an uniform pale yellowish umber colour, closely wrinkled lengthways with rather oblique raised lines. Whorls five and a half, short, much rounded, of slow longitudinal increase, deeply divided by a simple and scarcely slanting suture: apex obtuse. Body merely filling about a third of the dorsal length; its basal declination more or less abrupt.

Mouth unarmed, occupying a fourth only of the ventral length, of a somewhat roundish-oval figure, being bluntly angulated above, rounded and much receding below. Outer lip very narrowly and thinly reflected, not thickened internally, jutting out rather abruptly for a short space, straightish in the middle, arcuated below. Pillar lip subtrigonal, rather broadly reflected, curved anteriorly, but straightish above, where it runs almost at right angles to the scarcely slanting parietal portion of the inner lip. Umbilical chink conspicuous. Length not one line; breadth not quite two-fifths of a line.

The animal is rather slender, dark and streaked with black on the neck and tentacles, white on the sides and tail. The lower tentacles are almost obsolete.

This is one of our rarest British *Pupæ*, though common enough upon the Continent. The first record of it as a native species is the account of it by Dr. Fleming under the name of *Pupa obtusa*; to him it was communicated in 1813, from Fifeshire, by Mr. Chalmers, of Kirkaldy.

It was not re-discovered for many years, until noticed by Mr. Jeffreys on Durdham downs, near Bristol, and among the debris of Salisbury Crags, at Edinburgh, where it is not rare, by one of the authors of this work. A specimen was communicated as collected in Skye, by our lamented and talented friend, the late Mr. Macaskill. It is strangely local and confined in its distribution.

P. pygmæa, Draparnaud.

Dextral, very minute, smooth, or nearly so; whorls five, rounded; mouth with four or five teeth.

Plate CXXX. fig. 4, 5, 6.

Pupa pygmæa, Drap. Tableau Moll. p. 57; Hist. Nat. Moll. Terr. et Fluv. France, p. 60, pl. 3, f. 30, 31. — Fleming, Brit. Animals, p. 268. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 190. — Dupuy, Moll. du Gers, p. 41.—Philippi, Moll. Sicil. vol. ii. p. 221.— L. Pfief, Monog. Helic. vol. ii. p. 362

Turbo sexdentatus, junr., Mont. Test. Brit. p. 337.

Vertigo quinquedentata, and *quadridentata*, Studer, Verz. Schweiz. Conch.

Pupa quinquedentata, and *pygmæa*, Hartm. Neue Alpina, vol. i. p. 219.

Helix Isthmia cylindrica, Gray, Medical Repository, 1821, p. 239 (no description).

Vertigo pygmæa, Férus. Prodrom. Moll. p. 64.—Turt. Manual L. and F. W. Shells, p. 103, f. 83.— Gray, Manual L. and F. W. Shells, p. 201, pl. 7, f. 83.—Thompson, Ann. Nat. Hist. vol. vi. p. 114.—Brown, Illust. Conch. G. B. p. 41, pl. 18, f. 37. —Michaud, Comp. Drap. Moll. France, p. 71.—C. Ffeif. Deutsch. Land und Süssw. Moll. pt. i. p. 72, pl. 3, f. 47, 48. —Wagner, in Chemn. Conch. vol. xii. p. 176, pl. 235, f. 4125.—Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. p. 18.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 10, p. 29, f. 648.—Graells, Cat. Moll. Esp. p. 7.

Alæa vulgaris, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 359.

Vertigo alpestris, Alder, Mag. Zool. and Bot. vol. ii. p. 112 (locality only); Trans. Nat. H. Soc. Northumb. vol. ii. p. 340. — Gray, Manual L. and F. W. Shells, p. 202, pl. 12, f. 141.

Alæa pygmæa, Beck, Index Moll. Mus. Christ. Frid. p. 85.

Stomodonta pygmæa, Mermet, Moll. Pyren. p. 55.

Shell very minute, cylindraceous-subovate, subperforated, tolerably strong for its size, smooth, or very nearly so, glossy, a little translucent, fulvous brown. Whorls five, rounded, rather large, increasing with moderate rapidity ; spire perceptibly attenuated ; apex minute.

Aperture scarcely one-third the length of the shell, almost semi-oval, not angularly produced beneath, armed with four or five deeply seated teeth, of which one is parietal and situated half way between the two lips, two are palatal, one columellar, and the fifth, which is very obscure and minute (often, indeed, obsolete), lies at the base of the aperture. Peristome reddish, thickened, reflected but not broadly expanded, the outer lip very slightly indented ; lips united by a thin callus.

The variety *alpestris* (fig. 6) differs from the more typical form (f. 4) of *pygmæa*, in its somewhat olivaceous yellow or fulvous colouring, its greater transparency, its more elongated cylindrical shape, and somewhat narrower teeth, of which latter four alone are present.

The animal is rather stout and very active ; dark grey above, pale below, with stout upper tentacles, and nearly obsolete lower ones which have the aspect of sessile knobs.

This little shell is widely distributed, and perhaps the most common of the *Pupas* of the *Vertigo* section. It may be taken in numbers by laying a piece of old wood upon the grass at nightfall, and examining it in the morning, when the *Pupas* will be found adhering underneath a log. It occurs in all three kingdoms, and in most of the outlying islands. The variety *alpestris* occurs in Cumberland and Northumberland, and other northern counties. Mr. Gough observes that at Kendal it is chiefly found on slate.

P. SUBSTRIATA, Jeffreys.

Dextral, very minute, striated; whorls much rounded; mouth with six teeth (four alone are easily perceptible) of which two are parietal.

Plate CXXX. fig. 3.

Turbo sexdentatus, MONT. Test. Brit. p. 337, pl. 12, f. 8 (not young); MATON and RACK. Trans. Linn. Soc. vol. viii. p. 183.—TURT. Conch. Diction. p. 221.—DILLW. Recent Shells, vol. ii. p. 879.

Vertigo sexdentata, TURT. Manual L. and F. W. Shells, p. 103, pl. 7, f. 84.—BROWN, Illust. Conch. G. B. p. 41, pl. 14, f. 8.

Pupa ,, ALDER, Trans. Nat. H. Soc. Northumb. vol. i. p. 34.

Alæa substriata, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 515.

Vertigo ,, ALDER, Mag. Zool. and Bot. vol. ii. p. 112.—GRAY, Manual Land and F. W. Shells, p. 202, pl. 7, f. 84. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 114.

Pupa ,, ALDER, Trans. Nat. H. Soc. Northumb. vol. ii. p. 339.—L. PFEIF. Monog. Helic. vol. ii. p. 363.

Vertigo curta, HELD, Isis, 1837, p. 304.

Shell minute, cylindraceous, or oblong-cylindraceous, somewhat glossy, a little translucent, tawny, or yellowish horn-coloured (more rarely of a pale olivaceous tint), regularly striated longitudinally and rather obliquely. Whorls nearly five, well rounded, rather high, enlarging moderately and with tolerable regularity, the penult bulging a little beyond the others; spire obtuse. Aperture rather sinuated, obliquely subpyriform, occupying rather less than one-third of the entire length of the shell, slightly expanded and margined, somewhat indented externally a little above the middle, armed with six deeply seated and mostly pliciform teeth, of which two are parietal (lying on the space between the outer and pillar lips), two columellar, and two palatal (or inside the outer lip). Of these, the upper or posterior palatal being very small, and the lower or anterior columellar denticle at times being almost imperceptible, four alone are generally visible to lenses of ordinary power. Perforation indistinct.

The animal closely resembles that of the last species.

Probably a not uncommon shell, but often overlooked. It was originally noticed in the southern English counties by Mr. Jeffreys who found it near Barnstaple. It occurs in the Northumberland, Westmoreland and Yorkshire districts, but rarely, and among wet moss. In Ayrshire, in Scotland, and widely distributed in Ireland, though rare (W. Thompson).

P. ANTIVERTIGO, Draparnaud.

Dextral, minute, smooth; mouth with from seven to nine teeth and denticles.

Plate CXXX. fig. 7.

Pupa antivertigo, Drap. Tableau Moll. p. 57; Hist. Nat. Moll. Terr. et Fluv. France, p. 60, pl. 3, f. 32, 33.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 692. — L. Pfeif. Monog. Helic. vol. ii. p. 361.
„ *vertigo var.* α and γ, Hartm. Neue Alpina, vol. i. p. 219.
„ *octodentata*, Hartm. do.
Vertigo septemdentata, Férus. Prodr om. Moll. p. 64. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. p. 18.—Rossmässl. Iconog. Land und Süssw. Moll. pt. x. p. 28, f. 647.
„ *octodentata*, Studer, Verz. Schweiz. Conch.
„ *sexdentata*, C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 71, pl. 3, f. 43, 44.—Wagner, in Chemn. Conch. vol. xii. p. 175, pl. 235, f. 4124.
„ *antivertigo*, Michaud, Compl. Drap. Moll. France, p. 72. — Graells, Cat. Moll. Esp. p. 7.
„ *palustris*, Turt. Manual L. and F. W. Shells, p. 104, f. 85.—Gray, Manual L. and F. W. Shells, p. 204, pl. 7, f. 85. — Thompson, Ann. Nat. Hist. vol. vi. p. 114.—Brown, Illust. Conch. G. B. p. 41, pl. 18, f. 39.
Alæa palustris, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 360, 516.
„ *antivertigo*, Beck, Index Moll. Mus. Christ. Frid. p. 85.
Stomodonta „ Mermet, Moll. Pyren. p. 54.

Shell minute, ovate-oblong, much shining, dark chestnut brown, or tawny chestnut coloured, smooth, tolerably strong for its size, subumbilicated, well defined. Whorls five, rather quickly enlarging; the penult more convex than the preceding, and peculiarly large in proportion, being almost equal to the length of the aperture, which latter occupies nearly one-third of the shell; apex obtuse. Mouth somewhat trigonally subcordate, the outer lip being indented by an external sinus which runs parallel to the spire; with seven deeply seated distinct teeth, and usually two additional denticles, thus distributed: three parietal (or the upper part of the inner lip), three columellar, and three palatal (or on the outer lip), of which the upper palatal, which lies between the indentation and the posterior corner, and the lower parietal one are scarcely perceptible; the lower columellar one, which is exactly in the centre of the anterior corner, is likewise smaller than the two above it; the palatal teeth are sublamellar. Peristome slightly expanded, whitish, a little behind which is a broad but rather obscure rib. Base of the aperture produced and angular.

Animal blackish-grey; lower tentacles nearly obsolete.

This species was communicated to Dr. Leach as British by Mr. J. E. Gray, who found it on Wimbledon Common, near London, in 1817. It lives in or near marshy places. It is local, but has a wide range. South Wales, on the water flag in marshy ground near Swansea; at Bristol and Bath under ash boughs that have lain long on the ground (Jeffreys); Devon (T. Hincks); Northumberland (Alder); Ayrshire (W. Thompson); in localities, both south and north, in Ireland (W. Thompson).

P. pusilla, Müller.

Sinistral, mouth with from six to eight teeth and denticles.

Plate CXXX. fig. 8.

Vertigo pusilla, Müller, Hist. Verm. pt. 2, p. 124. — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 361, 516. — Gray, Manual L. and F. W. Shells, p. 205, pl. 7, f. 86. — Thompson, Ann. Nat. Hist. vol. vi. p. 115. — Brown, Illust. Conch. G. B. p. 42, pl. 18, f. 41. — Férus. Prodrom. Moll. p. 65. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 72, pl. 3, f. 45, 46.—Wagner, Chem. Conch. vol. xii. p. 177, pl. 235, f. 4126. — Michaud, Comp. Drap. Moll. France, p. 72. — Charpent. N. Denks. Schweiz. Gers. Nat. p. 18.— A. Müller, in Wiegm. Archiv. Nat. 1838, pt. 1, p. 211, pl. 4, fig. 5.—Porro, Malac. p. 68. —Rossmässl. Iconog. Land und Süssw. Moll. pt. 10, p. 29, f. 649.—Sowerby, Conch. Manual, f. 293.

Helix vertigo, Gmelin. Syst. Nat. p. 3664.

Pupa ,, Drap. Tableau Moll. p. 57; Hist. Moll. Terr. et Fluv. France, p. 61, pl. 3, f. 34, 35. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 191.—Hartm. Neue Alpina, vol. i. p. 219 (var. β).

Turbo vertigo, *var.* Mont. Test. Brit. p. 365.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 183.—Turt. Conch. Diction. p. 226.

Vertigo heterostropha, Turt. Manual L. and F. W. Shells, p. 105, f. 86.

Pupa pusilla, L. Pfeif. Monog. Helic. vol. ii. p. 364.

Shell minute, sinistral, of a produced subovate form, transparent, glossy, not distinctly striated, at most only obscurely striolate, somewhat perforated, of an uniform fulvous or pale brownish horn-colour.

Whorls five, moderately rounded, well defined; the last compressed at the base, and delicately scrobiculated at the aperture. Spire regularly attenuated; apex rather obtuse. Aperture contracted, semi-oval, rounded beneath, occupying scarcely one-third the length of the shell; peristome thin, whitish, only reflected at the columella, thickened within, and armed with six or seven deeply seated rather solid teeth; of which two (the lower one the larger) are parietal, two are palatal, or on the outer lip (the lower again the larger), and the remainder, of which that near the middle of the pillar is the more conspicuous, are either columellar or basal. An eighth denticle is stated to occasionally exist upon the pillar lip.

Animal dark grey above, pale at the sides and foot; its lower tentacles almost obsolete.

It lives among damp moss in wooded places, and is a local species, though not uncommon in the southern and eastern English counties. South Wales (Jeffreys). Mr. Alder records it from Northumberland, and Mr. Gough finds it usually upon slate in Westmoreland. Mr. W. Thompson notes it as very rare in Ireland, having been found only near Belfast by Mr. Hyndman and himself, and at Miltown Malbay in Clare by Professor Harvey.

P. VENETZII, Charpentier.

Sinistral, mouth with less than six teeth or denticles.

Plate CXXX. fig. 9.

Turbo vertigo, MONT. Test. Brit. p. 363, pl. 12, f. 6 (not var. p. 365) copied, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 183 (not var.) TURT. Conch. Diction. p. 226 (not var.) and DILLW. Recent Shells, vol. ii. p. 880.
Vertigo angustior, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 361. — ALDER, Mag. Z. and B. vol. ii. p. 112. — GRAY, Manual L. and F. W. Shells, p. 205.—BROWN, Ill. Conch. G. B. p. 42, pl. 14, f. 9.
,, *Venetzii*, CHARPENT. Denks. N. Schweiz. Gesel. p. 18, pl. 2, f. 11. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 10, p. 30, pl. 49, f. 650.
,, *hamata*, HELD. in Isis, 1837, p. 304, probably.
,, *plicata*, A. MÜLLER, Wiegm. Archiv. Nat. 1838, pt. 1, p. 210, pl. 4, f. 6.
Pupa Venetzii, L. PFEIF. Monog. Helic. vol. ii. p. 364.

Shell very minute (not being a single line in length), thin, not much shining, reddish fulvous, or pale umber-coloured, closely but not coarsely striate lengthways. Shape oval, swollen below the middle, abruptly and considerably contracted at the base, tapering above, with convex lateral outlines, to a very blunt apex. Whorls about five in number, rather short, moderately convex, the penult rather large in proportion to the very short body, which latter barely exceeds it in length, and almost immediately slopes downwards with an abrupt but not planulate declination. Suture oblique, simple, well-pronounced. Mouth whitish, very small, filling about a third of the ventral length, bluntly triangular (the angles being rounded off), appearing somewhat heart-shaped from the abrupt stricture which occurs on its outer lip at about two-fifths of the distance from its upper end, and divides the lip, as it were, into a smaller and larger loop. At this contraction, which produces upon the body externally, a broad and conspicuous spiral indentation, and internally a similar rib-like callus, there springs forth a sharp, curved tooth with an upward inclination, which forms nearly a circle with the first of the two laterally compressed and nearly equal sized parietal teeth or laminæ, with which the almost horizontal top of the aperture is armed. Pillar projecting into the aperture so greatly as to contract it, and presenting the appearance of a single broad and seemingly unarmed plate. Outer lip narrowly reflected, not at all prominent above, but slanting towards the axis almost from its commencement. Umbilical crevice indistinct.

The name *angustior* has priority, but the species was not defined under that appellation with sufficient clearness to ensure identification.

A rare shell. Near Swansea (Jeffreys); Cork (Humphreys *fide* Jeffreys); Miltown Malbay in Clare (Harvey *fide* Thompson).

Note.—The *P. cinerea* of Draparnaud, a native of Southern Europe, cited as British by Gray, in the Medical Repository for 1821 (vol. xv. p. 239), was introduced in error, having been intermixed by Dr. Leach with some shells collected at Battersea. (Gray, Manual, p. 13.)

BALEA, Prideaux.

Shell spiral, produced, many-whorled, elongated, resembling a *Clausilia*, but having no clausium; mouth ovate or sub-pyriform, plicated, usually with one imperfect fold; its margins unequal; columella simple or plicated.

Animal closely resembling that of *Bulimus.*

The species of this genus are intermediate in aspect between *Pupæ* and *Clausiliæ*. From the former they differ in the unequal margins of the mouth. They are few in number, and very dissimilar in aspect.

B. fragilis, Draparnaud.

Plate CXXVIII. fig. 8, 9.

Turbo perversus, Linn. Syst. Nat. ed. 12, p. 1240. — Penn. Brit. Zool. ed. 4. vol. iv. p. 130, pl. 82, f. 116. — Mont. Test. Brit. p. 355, pl. 11, f. 12; Suppl. p. 131.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 181, pl. 5, f. 2.—Rack. Dorset Catalog. p. 51, pl. 19, f. 11.—Turt. Conch. Diction. p. 226.

Bulimus „ Poiret, Prodr. p. 57.

Pupa fragilis, Drap. Moll. Ter. et Fluv. France, p. 68, pl. 4, f. 4. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 56, pl. 3, f. 16. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 178. — Nills. Moll. Sueciæ Ter. et Fluv. p. 48. — Desh. Encycl. Méth. Vers, vol. ii. p. 406.—Morelet, Moll. Portugal, p. 74.

Clausilia parvula, Gärt. Conch. Wett. p. 22.

„ *fragilis*, Stud. Verz. Schweiz. Conch. p. 20. — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 351. — Hartm. Neue Alpina, vol. i. p. 215. —Sturm, Deutsch. Fauna, sect. 6, pt. 7, pl. 1.—C. Pfeif. Deutsch. L. and S. Moll. pt. 3, p. 62.

Odostomia perversa, Fleming, Encycl. Edin. vol. vii. pt. 1, p. 76.

Balea fragilis, Gray, Zool. Journ. vol. i. p. 61. — Sowerby, Conch. Manual, f. 296. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 10, p. 24, f. 636.

„ *perversa*, Fleming, Brit. Anim. p. 271.—Macgiliv. p. 104.—Philippi, Moll. Sicil. vol. ii. p. 220. — L. Pfeif. Monog. Helic. vol. ii. p. 387.

„ *fragilis*, Alder, Trans. Nat. H. Soc. Northumb. vol. i.—Turt. Manual L. and F. W. Shells, p. 87, f. 70.—Brown, Ill. Conch. G. B. p. 37.

Clausilia perversa, CHARPENT. N. Denks. Schweiz. Ges. Nat. 1837, p. 17.
Fusulus fragilis, FITZING. Vers. Ostreich Weichth. p. 105.
Balæa perversa, GRAY, Manual L. and F. W. Shells, p. 207, pl. 6, f. 70. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 115.
Clausilia uniplicata, CALCARA, Effem. Sc. et Let. Sicil. p. 82.
Stomodonta fragilis, MERM. Moll. Pyren. p. 48.

Shell small, sinistral, very thin, fusiform-turreted, of a semi-transparent olivaceous or yellowish horn-colour, with a satin-like lustre, slightly roughened by delicate somewhat irregular, and partially obsolete longitudinal raised wrinkles. Whorls from six to nine, moderately convex, strongly defined; the last rounded at the base; spire turreted; apex rather acute for the genus. Aperture from angulated pyriform to rounded pear-shaped; outer lip a little arcuated. Peristome thin, simple, slightly reflected upon the columella, where it is white, and forms an incipient subumbilicus; margins united in the aged shell by a thin callus, from whence issues a small parietal lamella; no other folds; left lip sinuous above.

A third of an inch is about the ordinary length of specimens, although some are occasionally obtained five lines long.

The animal of this shell reminds us more of the aspect of a *Bulimus* (especially of *B. acutus*) than of a *Pupa* or *Clausilia*. It is dusky grey above, striped with a mottled dark band on each side of the neck; these bands become very dark on the rather stout and long clavate upper tentacula, and send branches down to the very short lower tentacula. The foot, sides and tail are very pale grey. When crawling it carries the shell in a line straight away behind it.

This shell is widely, if not quite generally distributed throughout the British Isles. It delights more especially in living upon trees, and may be found in numbers often lodged under the loose bark. It occurs also in walls and under stones.

CLAUSILIA, Draparnaud.

Shell spiral, produced, elongato-fusiform, almost always sinistrorsal. Aperture elliptic or pear-shaped, always toothed, and closed in its throat by a testaceous elastic folded lamellar valve or clausium.

Animal short and usually broad, obtuse behind, with stout clavate upper tentacula, and very small lower ones.

The shells of this genus are equally remarkable for the peculiarities of their shape, and for the curious opercular valve, or rather independent process of the shell closing the throat of their apertures. The majority of species are centralized in south-eastern Europe.

C. laminata, Montagu.

Large, smooth, or nearly so.

Plate CXXVIII. fig. 10.

Helix bidens, Müller, Hist. Verm. pt. 2, p. 116. — Sturm, Fauna Deutsch. sect. vi. pt. 2, pl. 9.

Turbo „ Chemn. (not of Lin.) Conch. Cab. vol. ix. pt. 1, p. 119, pl. 112, f. 960, no. 1. — Pennant, Brit. Zool. ed. 4, vol. iv. pl. 81 (no numeral).—Gmelin, Syst. Nat. p. 3609.

Bulimus „ Bruguiere, Encycl. Méth. Vers, vol. i. p. 352.—Poiret, Prodr. Cog. T. et Fl. Aisne, p. 57.

Turbo perversus, Pulteney, Hutchins, Dorset. p. 46, in part.

„ *laminatus*, Mont. Test. Brit. p. 359, pl. 11, f. 4. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 179. — Dorset Catalog. p. 51, pl. 19, f. 9.—Turt. Conch. Diction. p. 224, f. 70.—Dillw. Recent Shells, vol. ii. p. 874.

Pupa bidens, Drap. Tableau Moll. France, p. 61.

Clausilia bidens, Drap. Moll. Ter. et Fluv. France, p. 68, pl. 4, f. 3 to 7.— Fleming, Brit. Anim. p. 271. — Gray, Manual L. and F. W. Shells, p. 212, pl. 5, f. 53. — Brown, Illust. Conch. G. B. p. 37, pl. 14, f. 12, and pl. 18*, f. 24, 25.—Lam. Anim.

s. Vert. (ed. Desh.) vol. viii. p. 252. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 60, pl. 3, f. 25.—HARTM. Neue Alpina, vol. i. p. 217. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. vol. i. p. 76, f. 29; pt. 7, p. 16, f. 461 to 465, 467.—CHARPENT. N. Denks. Schweiz. Ges. Nat. vol. i. p. 17.—ROTH, Moll. Orient. p. 20.—PHILIPPI, Moll. Sicil. vol. ii. p. 118.

Helix derugata, FÉRUS. Prodrom. Moll. p. 529 (Cochlodina).

Clausilia derugata, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 354.

„ *laminata*, TURT. Manual L. and F. W. Shells, p. 70, f. 53.—DUPUY, Moll. du Gers, p. 35. — L. PFEIF. Monog. Helic. vol. ii. p. 397.

„ *lucida*, MENKÉ, Synopsis Moll. ed. 2, p. 129.

„ *ungulata*, BECK, in Pfeif. Symbolæ, p. 61.

Shell fusiform, highly glossy, rather pellucid, of a rufous or brownish horn-colour, rarely of a transparent greenish white, nearly smooth, but a little striated at the base of the last whorl. Whorls ten to twelve, depressed convex; spire turreted, apex rather obtuse. Suture distinct, not crenated. Aperture ranging from oval-pyriform to roundish oval; peristome whitish, continuous, margined, and a little expanded, but not reflected, subangulated above, rounded below; parietal or upper plait small and straightish, lower fold strong, prominent, and much curved, no lunella; four deep-seated palatal folds, of which the upper is by far the longer, and the next very short; a very slight umbilical crevice.

Fine specimens measure three quarters of an inch in length, and two lines in breadth.

Animal of a general brownish yellow hue, dusky on neck and head, with dark lines leading to the stout upper tentacles. Sides mottled with tawny; foot slenderer than usual in this genus, but obtuse and expanded behind.

This handsome land-shell delights in living among the dead leaves of beech wood, and crawls up the trunk of the beech, a tree which, as remarked to us by Mr. Webster.

is a favourite resort of numerous mollusks such as *Limax arborum*, *Helix lapicida*, and other species, *Balea* and *Clausilia;* these do not seem tempted merely by the smoothness of the beech, for they reject the sycamore and ash growing in the same woods. *Clausilia laminata* is in the main a south British form, though found in various districts of both South and North of England, extending from the Channel counties to Northumberland. In Ireland it is rare and local, as at Cavan (T. W. Warren), and Florence Court, in Enniskillen (W. Thompson).

C. BIPLICATA, Montagu.

Greyish brown, ventricose, often with whitish streaks; the raised striæ neither crowded nor granular: mouth with only two plaits.

Plate CXXIX. fig. 4.

Helix perversa, MÜLLER, Verm. Ter. et Fluv. p. 118 ?

Turbo biplicatus, MONT. Test. Brit. p. 361, pl. 11, f. 5. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 179.—TURT. Conch. Diction. p. 224.—DILLW. Recent Shells, vol. ii. p. 874.

Clausilia plicata, Gärt. Wetteran Conch. p. 22.

„ „ *var. b.* HARTM. Neue Alpina, vol. i. p. 217.

„ *perversa*, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 63, pl. 3, f. 28.

„ *ventricosa*, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 63, pl. 3, f. 29. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 354. — FORST. Nov. Act. Leopol. vol. xix. pt. 2, p. 251.

„ *biplicata*, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 61, pl. 3, f. 27.—FLEMING, Brit. Animals, p. 271.—TURT. Manual L. and F. W. Shells, p. 72, f. 55.—GRAY, Manual L. and F. W. Shells, p. 214, pl. 5, f. 55. — BROWN, Ill. Conch. G. B. p. 38.—FORST. Nov. Act. Leopol. vol. xix. p. 277, pl. 58, f. 8.—L. PFEIF. Monog. Helic. vol. ii. p. 469.

Odostomia „ FLEMING, Encycl. Edin. vol. vii. pt. 1, p. 77.

Clausilia similis, *Montagui*, GRAY, Annals Philos. 1825, p. 413 (name only).

„ „ CHARPENT. in Rossm. Iconog. pt. 1, p. 77, f. 30; pt. 7, p. 17, f. 168; pt. 11, p. 7, f. 705, 706. — CHARPENT. Cat. Moll. Suisse, p. 17.—ROTH, Moll. It. Orient. p. 20.—ROSSMÄSSL. Iconog. pt. 7, p. 17, f. 469.

vivipara, HELD. in Isis, 1837, p. 319.

Clausilia cordata, Forst. Nov. Act. Leopol. vol. xix. (1841) p. 269, pl. 58, f. 1.
„ *vulnerata*, Forst. Nov. Act. Leopol. vol. xix. (1841) p. 270, pl. 58, f. 2.
„ *infulæformis*, Forst. Nov. Act. Leopol. vol. xix. (1841) p. 272, pl. 58, f. 3.
„ *radicans*, Forst. Nov. Act. Leopol. vol. xix. (1841) p. 273, pl. 58, f. 4.
„ *rostrata*, Forst. Nov. Act. Leopol. vol. xix. (1841) p. 274, pl. 58, f. 5.
„ *quadrata*, Forst. Nov. Act. Leopol. vol. xix. (1841) p. 275, pl. 58, f. 6.

Shell fusiform, not very strong, a little transparent, greyish-brown, occasionally streaked with linear whitish or cinereous longitudinal markings, with distinct and numerous well-raised fine costellæ, which become rather distant near the mouth, and are neither crowded nor at all granulated. Whorls about twelve, rather flat, but well defined by a profound suture; the last whorl with the basal crest, or external fold, prominent; spire rather quickly attenuated, apex moderately blunt. Aperture subpyriform-oval, or oboval, canaliculated at the base; peristome continuous, whitish, raised all round, expanded, slightly produced, sublabiated, the outer lip not simply arcuated, but subangulated below. Upper lamella very distinct, submarginal, nearly adjacent to the outer lip; lower lamella more deeply seated, approaching the preceding as it recedes inwards, not lying low down in the aperture. Lunella, or inner basal lamina thin, but distinct when the shell is held up to the light, as likewise are the two inwardly converging thread-like palatal folds, of which the second, which lies about the middle of the outer lip, is the shorter and stronger. Occasionally two additional minute, short laminar denticles intervene between the folds upon the pillar lip.

Usually two-thirds of an inch long, but occasionally three-quarters.

Animal dark-grey.

This is a southern species. It occurs around London, and was stated by Miller to exist in the neighbourhood of Bristol.

C. plicatula, Draparnaud.

Plate CXXIX. fig. 3.

Clausilia plicatula, Drap. Moll. Ter. et Fluv. France, p. 72, pl. 4, f. 17, 18.—Fleming, Brit. Anim. p. 272.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 353.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 64, pl. 3, f. 31.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 201.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 79, f. 32; pt. 7, p. 18, f. 471 to 475.—Forst. Nov. Act. Leopol. vol. xix. pt. 2, p. 276, pl. 58, f. 7.—L. Ppeif. Monog. Helic. vol. ii. p. 481.
Turbo conversus, Alten, Erd und Flüssconch. Augsburg, p. 18, pl. 2, f. 3.
Clausilia corrugata ? Gärtn. Conch. Wetteran, p. 21.
,, *Iphigenia Rolphii*, Gray, Medical Repository, 1821 (no description.)
,, *Rolphii*, Gray, Annals Philos. 1825, p. 413 (no description).—Turt. Manual L. and F. W. Shells, p. 71 (ed. Gray), p. 215, f. 54.—Brown, Ill. Conch. G. B. p. 38, pl. 18, f. 31.
Stomodonta plicatula, Mermet, Moll. Pyren. p. 47.

Shell subcylindraceous fusiform, neither slender nor much elongated (often, indeed, abbreviated), nor transparent, moderately strong, subrimate, umber, or of a reddish chocolate brown, not variegated; costellar striæ close (yet slightly wider than their intervals, which are not apparently striated across), fine, only slightly raised. Whorls ten to thirteen, not particularly convex; spire regularly tapering; apex not peculiarly blunt. Mouth rounded, pear-shaped; peristome continuous, slightly raised (the edge not appressed above), dilated, and somewhat reflected throughout. Parietal, or upper lamella prominent, reaching the edge; pillar fold, or lower lamella, projecting, yet not advancing to the margin; space between the principal folds set with two or three smaller marginal ones; lunella and subcolumellar fold, for the most part, tolerably evident; a single posterior (subsutural) palatal ridge. Ordinary size three-fifths by a full eighth of an inch; but sometimes larger.

The animal is very short, thick, and broad, rugosely granulated, of a dead dusky blackish grey, the dark colour broken up into lines and squarish spots as it approaches the paler margin of the foot. Sole of the foot greyish-white, tail broad, linguiform. Upper tentacles stout and clavate, black; lower ones extremely short, paler. When at rest and protruded, it carries its upper tentacles nearly erect. This description is drawn up from some living examples communicated by our talented friend Mr. W. Thomson, of King's College.

This rare species was first discovered in Britain by Mr. Rolph, who found it in Charlton Wood, Kent. It occurs in other Kentish localities. Hastings, Sussex (Gray); Hampshire; Dovedale in the Marsh, Gloucestershire (Beevor, Jeffreys).

C. NIGRICANS, Maton and Rackett.

Slender, chocolate brown: the raised striæ crowded, fine, subgranular; mouth small, with three plaits.

Plate CXXIX. fig. 1, 2.

Strombiformis perversa, young, DA COSTA, Brit. Conch. p. 187.*
Turbo perversus, PULTENEY, Hutchins, Hist. Dorset, p. 46, in part. — DONOV. Brit. Shells, vol. ii. p. 72.
„ *bidens*, (not Linn.) MONT. Test. Brit. p. 357, pl. 11, f. 7.

---

* The shell which Da Costa describes as the adult state of this species appears distinct, and if indigenous, was probably one of our larger corrugated species. He states that it differs from the young in being double or treble the size, with coarser striæ, and proportionably stronger in its several parts: he further states, that most have eleven or twelve turns, and some are bidentated, and that the much reflected

Clausilia dubia, (A VARIETY) Drap. Moll. Ter. et Fluv. France, p. 70, pl. 4, f. 10 ?—Alder, Trans. Northumb. vol. ii. p. 339. —Gray, Manual L. and F. W. Shells, p. 216, pl. 12, f. 143. — Desh. Lam. Anim. s. Vert. vol. viii. p. 209 ?

Turbo nigricans, Maton and Rack. Trans. Linn. Soc. vol. viii. p. 180.—Mont. Test. Brit. Suppl. p. 131.—Rack. Dorset Catal. p. 51, pl. 19, f. 10.—Turt. Conch. Diction. p. 225.—Dillw. Recent Shells, vol. ii. p. 375.

Odostomia nigricans, Fleming, Ed. Encycl. vol. vii. pt. 1, p. 76.

Clausilia roscida, Studer, Verz. Schweiz. Conch. p. 20.

,, *cruciata*, Studer, Verz. Schweiz. Conch. p. 20. — Charpent. Moll. Suisse, p. 17, pl. 2, f. 9 ?

,, *plicatula, var. b* ? and *d*, Hartm. Neue Alpina, vol. i. p. 216.

,, *Everettii*, Miller, Ann. Philos. new ser. vol. iii. (1822) p. 377 (teste Jeffreys, Gray, &c.).

,, *perversa*, Fleming, Brit. Animals, p. 271.

,, *nigricans*, Jeffreys, Trans. Lin. Soc. vol. xvi. p. 351. — Thompson, Ann. Nat. Hist. vol. vi. p. 116. — Gray, Manual L. and F. W. Shells, p. 217, pl. 5, f. 58. — L. Pfeif. Monog. Helic. vol. ii. p. 476.

,, *parvula* (A VARIETY), Turt. Zool. Journ. vol. ii. p. 566; Manual L. and F. W. Shells, p. 75, f. 59.—Jeffreys, Trans. Lin. Soc. vol. xvi. p. 352, 513.

,, *crasula*, Potiez and Mich. Gal. Douai, Moll. vol. i. p. 180, pl. 18, f. 9, 10 ?

,, *rugosa*, C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 63, pl. 3, f. 30.—Turt. Manual L. and F. W. Shells, p. 74, f. 58.—Alder, Mag. Zool. and Bot. vol. ii. p. 111.—Brown, Illust. Conch. G. B. p. 38. — Forst. Nov. Act. Leopol. vol. xix. p. 279, pl. 58, f. 9 ?

,, *obtusa*, C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 65, pl. 3, f. 33, 34.

Shell cylindraceous-fusiform, usually slender, strong, nearly opaque, with a satin-like lustre, chocolate brown, with, for the most part, short irregular whitish, or ash-coloured streaks or spots; whorls, from seven to eleven (usually ten), in number, flattish, or only moderately

outer lip is flat, thick, milk-white, and very broad. From this last character it has been conjectured that it was identical with the *Turbo labiatus* of Montagu, but the figures given by the two writers are dissimilar; perhaps, however, Da Costa's (Brit. Conch. pl. 5, f. 15, copied as pl. 21, f. 15, in the Dorset Catalogue), although from its rudeness it is impossible to pronounce with certainty upon it, was drawn from our *nigricans*, and enlarged to the size of the supposed adult.

convex, crowded with fine longitudinal raised striæ, which assume a somewhat granulated appearance under the lens, from being closely decussated by almost obsolete spiral lines; last whorl much contracted near its base, and somewhat scrobiculated by the hollows on either side of the rather prominent basal fold; spire perceptibly attenuated; apex but little obtuse. Aperture small, pyriform, rather elongated than otherwise, occasionally subcanaliculated at the base; peristome of a whitish or pale brownish hue, rather strong, elevated, continuous, not broadly reflected. Upper lamina of the pillar-lip, acute, prominent, and near the outer lip; lower lamina more deeply seated, bifurcated; an occasional intermediate minute fold. A distinct lunella or basal fold, a sunken subcolumellar one, a narrow superior palatal one, and sometimes a second running transversely from the palatal callus. Scarcely half an inch long.

Variety *dubia* (f. 2). Larger, more ventricose anteriorly, brownish; the lunella and subcolumellar fold more or less obsolete.

The animal is rather elongated for its genus, the foot being narrower than in allied forms. It is dark grey, rather mottled and rugose above, paler about the foot and tail. The upper tentacles are stout and clavate, the lower ones very short.

This is a universally diffused British and Irish shell, living under stones, on walls, and occasionally in crevices of trees. On chalk downs the smaller variety is common. The large form, *dubia*, is well known in the north-east of England. Like many other widely distributed land-shells, it is subject to great variation, and has been split up by Continental authors into several spurious species.

SPURIOUS.*

C. BIDENS, Linnæus.

Turbo bidens, LINN. Syst. Nat. ed. 12, p. 1240. PULT. Hutchins, Hist. Dorset, p. 46, from type.—MATON and RACK. Trans. Linn. vol. viii. p. 178, pl. 5, f. 3.—TURT. Conch. Diction. p. 224.
Clausilia papillaris, DRAP. Moll. Ter. et Fluv. France, p. 71, pl. 4, f. 13.
„ *bidens*, TURT. Manual Land and F. W. Shells, p. 73, f. 56.

A common species in the South of Europe. Pulteney, whose specimen was figured in the "Linnean Transactions," mentions it as a Dorset species, but this locality has never been trusted to.

For the foreign synonymy see "Monographia Heliceorum," vol. ii. p. 453 (*Cl. bidens*).

C. LABIATA, Montagu.

Turbo labiatus, MONT. Test. Brit. p. 362, pl. 11, f. 6. — MATON and RACK. Trans. Lin. Soc. vol. viii. p. 180. — RACK. Dorset Catalog. p. 51. — TURT. Conch. Diction. p. 225. — DILLW. Recent Shells, vol. ii. p. 875.
Odostomia labiata, FLEMING, Encycl. Edin. vol. vii. pt. 1, p. 77.
Clausilia „ FLEMING, Brit. Animals, p. 272. — JEFFREYS, Trans. Lin. Soc. vol. xvi. p. 323, 513. — TURT. Manual Land and F. W. Shells, p. 74, f. 57.

Shell fusiform, not slender, nor cylindrical, but much attenuated above, and a little swollen at the penult and antepenult volutions; more or less strong, not variegated, ash-coloured, with extremely fine and numerous raised longitudinal threads that are narrower than their intervals. Whorls nine, flattish, rather broad; the apical coils rounded and smooth. Mouth large, broadly and somewhat squarely oval, the cavity itself obliquely subpyriform: the peritreme free, white, strong, and broadly reflected all round.

---

* The drawing of *C. solida*, in Kenyon's paper on British Shells (Mag. Nat. Hist. vol. i. p. 426, f. 183, *m*), is merely illustrative, and not avowedly taken from a British specimen. Similarly, the rude representation (fig. 183, *l*) of what is termed the *C. ventricosa* of Draparnaud, is merely given from Mr. Kenyon's belief that it is identical with our *biplicata*.

Lamellæ close, acute, approaching each other internally, the oblique one deep-seated, high up: two posterior palatal threads; a thick subcolumellar fold. Length two-thirds of an inch, breadth a line and two-thirds.

An exotic (? from Malta or the Grecian Archipelago) species, introduced by Montagu, on the authority of a Mr. Swainson, who supposed it identical with some shells he had seen taken from Hyde Park and Battersea Fields. Our description is taken from Turton's example.

ZUA. Leach.

Shell spiral, cylindrical, elongate-ovate, smooth, and shining with a vitreous lustre, derived from the polished epidermis. Mouth ovate, peristome entire, simple, thickened, but not reflected. Columella imperforate.

Animal closely resembling that of *Helix*, and having a similar dentition; the central denticle of each series is very minute.

The brilliant little shells composing this group, have a peculiarity of habit which entitles them to be kept generically apart from *Bulimus* as much as *Pupa* or *Balea*. Comparatively few species have, as yet, been met with. They represent (in conjunction with the next genus) the *Pupinæ* among the *Cyclostomidæ*.

Z. lubrica, Müller.

Plate CXXV. fig. 8, and (animal), Plate G.G.G. fig. 5.

Helix lubrica, Müller, Hist. Verm. pt. 2, p. 104.— Mont. Test. Brit. p. 390, pl. 22, f. 6.— Maton and Rack. Trans. Linn. Soc. vol. viii. p. 213, pl. 5, f. 12.—Dorset Catalog. p. 55, pl. 21, f. 18.—Turt. Conch. Diction. p. 64.—Férus. Prodr. 374 (Cochlicopa).

„ *subcylindrica*, Chemn. Conch. Cab. vol. ix. pt. 2, p. 167, pl. 135, f. 1235.—Dillw. Recent Shells, vol. ii. p. 952.

„ *splendidula*, Gmelin, Syst. Nat. p. 3655.

Turbo muscorum, Penn. Brit. Zool. ed. 4, vol. iv. pl. 82, f. 118?

Bulimus lubricus, Brug. Encycl. Méth. Vers, vol. i. p. 311.— Fleming, Brit. Anim. p. 265.—Turt. Manual L. and F. W. Shells, p. 82,

f. 65. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 110. — MACGILLIV. Moll. Aberd. p. 97. — BROWN, Illust. Conch. G. B. p. 36.—DRAP. Moll. Ter. et Fluv. France, p. 75, pl. 4, f. 24. — LAM. Anim. S. Vert. (ed. Desh.) vol. viii. p. 237.— STURM, Deutsch. Fauna, sect. vi. pt. 4, pl. 14.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 17, p. 50, pl. 3, f. 7.— KRYNICKI, Bull. Soc. Nat. Moscou, vol. vi. p. 14.—GOULD, Invert. Massach. p. 193, f. 124.—MORELET, Moll. Portugal, p. 73.

Bulinus lubricus, HARTM. Neue Alpina, vol. i. p. 222.—SOWERBY, Conch. Manual, f. 285.

Cochlicopa lubrica, RISSO, Hist. Nat. Europe Mér. vol. iv. p. 80.

Cionella „ JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 347, 513.

Achatina „ MENKÉ, Synopsis Moll. ed. 2, p. 29. — ALDER, Mag. Zool. and Bot. vol. ii. p. 210.—MICHAUD, Comp. Moll. Ter. et Fluv. France, p. 51.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. vol. i. p. 88, f. 43.—BRUMATI, Monfalcone, p. 30.— PHILIPPI, Moll. Sicil. vol. ii. p. 115.

Columna „ JAN, Catal. p. 5.

Styloides lubricus, FITZING. Syst. Verz. p. 105.

Zua lubrica, GRAY, Manual L. and F. W. Shells, p. 188, pl. 6, f. 65.

Shell elongated oblong, the lower portion (extremity excepted) subcylindrical, the upper portion rather slowly tapering to a very blunt and depressed apex; rather thin, smooth, highly polished, transparent, wholly of a brownish umber, or of a smoky horn-colour (more rarely greenish white). Whorls six, regularly convex, or even a little rounded, of not very rapid increase, divided by a fine yet distinct and moderately slanting suture; penult turn rarely twice as broad as high, quite as broad, and rather large in proportion to the body, which fills about three-sevenths only of the dorsal length, is narrow, not at all ventricose, has a gradual convex basal declination, and tapers early to a bluntly rounded extremity. Mouth small, only filling about a fifth of the ventral area, and scarcely a third of the total length; of a somewhat lanceolate-oval form, being acutely angulated above, devoid of sculpture. Outer lip regularly arcuated, but little prominent, especially anteriorly, not expanded nor reflected, but thickened within by a narrow callus, usually reddish or claret colour. Pillar lip narrow, a little strengthened, short, very slightly twisted, most indistinctly subtruncated below. No umbilical chink. Length, a quarter of an inch; breadth, rather more than a line.

The animal is thick and short, of a general lead-blue hue, darker on the neck and tentacula. The upper tentacles are stout and clavate, the lower ones very short. The foot is acute and short posteriorly, not reaching beyond the bound of the second whorl.

A very common and pretty little shell, plentiful under stones, and among fallen leaves, in both moist and dry places, in all parts of the British Isles. It ascends to a considerable elevation among mountains. It has a very wide range throughout Europe.

Note.—The *Buccinum obtusulum* of authors (MONT. Test. Brit. p. 250; MATON and RACK. Trans. Linn. Soc. p. 140; TURT. Conch. Diction. p. 18; FLEMING, Brit. Anim. p. 344; BROWN, Ill. Conch. G. B. p. 4, pl. 4, f. 18) is derived solely from a wretched drawing (f. 59) in Walker's "Testacea Minuta," which may possibly be intended for the fry of this species.

AZECA. LEACH.

Shell spiral, cylindrical, elongate-ovate, smooth, and shining with a vitreous lustre, derived from the polished epidermis. Mouth ovate, peristome entire, toothed, thickened but not reflected. Columella imperforate.

Animal like that of *Zua*.

This genus is so nearly allied to the last, that it might with convenience be regarded as a subdivision of it. Practically, its characters are easily recognized. The denticulated (and as if ringent aperture) of the shell conspicuously distinguishes it.

A. TRIDENS, Pulteney.

Plate CXXV. fig. 9.

Turbo tridens, PULTENEY, Hutchins, Hist. Dorset, p. 46.—MONT. Test. Brit. p. 338, pl. 11, f. 2; Suppl. p. 125.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 181.—Dorset Catalog. p. 51, pl. 19, f. 12.—LASKEY, Mem. Werner. Soc. vol. i. p. 406, pl. 8, f. 11.—TURT. Conch. Diction. p. 219.
Helix Goodallii, FÉRUS. Prodrom. 492, ter. (Cochlodonta).
Carychium Menkeanum, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 70, pl. 3, f. 42.
Pupa Menkeana, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 3, p. 62, pl. 7, f. 7, 8.
Azeca tridens, FLEMING, Brit. Animals, p. 269.—ALDER, Trans. Nat. Hist. Soc. Northumb. vol. i. p. 32.—GRAY, Manual L. and F. W. Shells, p. 189, pl. 5, f. 52.—BROWN, Illust. Conch. G. B. p. 42, pl. 14, f. 2.—SOWERBY, Conch. Manual, f. 290.
Pupa Britannica, KENYON, Mag. Nat. vol. i. p. 426, f. 182, n.
Carychium politum, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 365.
Azeca Matoni, TURTON, Manual L. and F. W. Shells, p. 68, f. 52.—VILLA, Syst. Disp. p. 20.
Cionella Goodallii, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 517.
Pupa „ MICHAUD, Comp. Drap. Moll. France, p. 68, pl. 15, f. 39, 40.—LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 193.
Azeca Goodallii, ALDER, Mag. Zool. and Bot. vol. ii. p. 110.
Achatina „ ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 10, p. 33, f. 654.
„ *tridens*, L. PFEIF. Zeitschrift Malacozool. 1846, p. 152; Monog. Helic. vol. ii. p. 277.

Shell of a narrow chrysalis shape, being elongated-oblong, subcylindrical in the middle, and tapering at the blunted extremities, suddenly so below, gradually so above; tolerably firm, but more or less translucent, highly polished, fulvous or reddish tawny horn-colour (rarely of a greenish white), smooth, excepting a few longitudinal wrinkles towards the not-strongly defined simple suture. Whorls seven or eight, merely but equably convex; the earlier ones very short and of a slow longitudinal increase; the penult longer; the body short (not much more than half as long as the spire), not at all ventricose, but attenuating immediately with a gradual but decidedly convex declination to a rounded extremity. Mouth remarkably small, usually filling only an eighth of the ventral surface, not at all projecting, but leaning rather to the left, obliquely subtrigonal pear-shaped. Peristome rendered entire by a pale callous rim (that is raised at its edge, excepting at the slightly sinuated upper end of the outer lip), armed internally with a moderate-sized tooth in the middle of the outer lip, a solid blunt one at the anterior end of the pillar, and a projecting lamella or laterally pinched tooth on the parietal portion of the inner lip (just above and sloping towards the opposite labral one); two denticles are also for the most part present, one immediately over the lamella, the other half way between it and the columellar tooth. No umbilical crevice. Length, a quarter of an inch; breadth, a little more than a third of the length. In a variety there is a strong additional tooth in the throat beneath the labral one, and one or two more palatal teeth are sometimes visible.

The animal is very dark in colour, nearly black above, and resembles closely that of *Zua lubrica*.

This pretty shell, though scarce and local, is, nevertheless, widely distributed in England, ranging from the southern counties to Northumberland, and occurring, for the most part, in wooded districts, where it is found among moss. It lives in company with the preceding species, but is found much more sparingly. Where it occurs, it is quite as plentiful in the north as in the south, but appears to be rare in the south-west. It is probably most abundant in the northern English counties, whence it may extend into the southernmost Scotch counties, but soon reaches its limits. It does not occur in the Isle of Man nor in Ireland.

It is widely distributed on the Continent.

ACHATINA. Lamarck.

Shell spiral, ovate or elongated, turreted, invested with an epidermis, which is frequently (in exotic species) coloured, but not polished and shining. Mouth ovate or elongated, canaliculated below in consequence of the truncation of the pillar-lip ; peristome simple, never reflected.

Animal closely resembling that of the *Bulimus*.

Some of the largest of known land-shells belong to this extensive, though somewhat artificially composed, genus. They are mostly tropical, and often as remarkable for beauty of colouring as for size. In Britain we possess only a single, and that diminutive representative.

A. acicula, Müller.

Plate CXXVIII. fig. 4.

Buccinum acicula, Müller, Hist. Verm. pt. 2, p. 150. — Dillw. Recent Shells, vol. ii. p. 652.

Bulimus „ Bruguière, Encycl. Méth. vol. i. p. 311.—Drap. Moll. Ter. et Fluv. France, p. 75, pl. 4, f. 25, 26. — C. Pfeif. Deutsch. Land und Süssw. Moll. p. 51, pl. 3, f. 8, 9. — Charpent. N. Denks. Schweiz. Ges. Nat. vol. i. p. 13 (Polyphemus).

Helix octona, Gmelin, Syst. Nat. p. 3653.

Buccinum terrestre, Mont. Test. Brit. p. 248, pl. 8, f. 3. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 139.—Turt. Conch. Diction. p. 18.

Helix acicula, Studer in Coxe, Travels (Hartm.). — Férus. Prodrom. 371 (Cochlicopa).

Achatina „ Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 304. — Fleming, Brit. Animals, p. 267. — Turt. Manual L. and F. W. Shells, p. 89, f. 71. — Gray, Manual L. and F. W. Shells, p. 191, pl. 6, f. 77.—Brown, Illust. Conch. G. B. p. 36, pl. 18, f. 12. Philippi, Moll. Sicil. vol. i. p. 142, pl. 8, f. 25; vol. ii. p. 115. —Cantraine, Malac. Med. p. 138. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 10, p. 35, f. 658. — L. Pfeif. Monog. Helic. vol. ii. p. 274.

Bulinus „ Hartm. Neue Alpina, vol. i. p. 222.

Acicula eburnea, Risso, Hist. Nat. Europe Mér. vol. iv. p. 81.
Cionella acicula, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 348.
Columna „ Jan, Catal. p. 4.
Styloidis „ Fitzinger, Syst. Vers, p. 105.
Acicula „ Beck, Index Moll. Mus. Christ. Frid. p. 79.
Polyphemus „ Villa, Disp. Syst. p. 20.—Graells, Cat. Moluscos Ter. p. 7.
Cecilioides „ Beck, Amtl. Ber. Vers in Kiel (1846), p. 122.

Shell small, slender, turreted-cylindraceous, being a little attenuated below, and gradually tapering above to a very blunt and rounded apex; uniform white, perfectly smooth and shining, very fragile. Whorls six, merely convex, often indeed but slightly so, being more or less flattened in the middle, of rather irregular increase, the apical coil being somewhat bulbiform, and the penult volution abruptly elongated. Body filling two-fifths of the dorsal length; its basal declination rounded, but not sudden. Suture simple, profound, moderately slanting, often appearing marginated, from the transparency of the shell. Mouth lanceolate, devoid of sculpture, not filling two-fifths of the ventral length. Outer lip simple, acute, not prominent, arcuated below, barely convex above. Pillar curved, narrowly truncated at the extremity; the lip appressly reflected: no vestige of an umbilicus. Length a fifth of an inch, nearly quadruple its breadth.

The animal is white; its foot is acute behind. The upper tentacula are said to be deprived of eyes.

This pretty but minute mollusk lives at the roots of grass, and apparently prefers moist places, though the dead shells are found in many localities rather plentifully; living specimens are comparatively rarely to be met with. In many places, where it is plentiful, it must be regarded as subfossil, and like *Succinea oblonga* appears to have abounded in Britain, towards and after the close of the tertiary epoch. It is distributed at present, though sparingly, throughout England, and ceases probably in the south of Scotland. It is not found in the Isle of Man. In Ireland it is found in the neighbourhood of Dublin (Mr. Hopkins), and other localities, but is scarce. It is widely diffused on the Continent.

SUCCINEA. Draparnaud.

Shell spiral, ovate, oblong, or rounded, thin and translucent ; body whorl very large, imperforate, covered with a corneous epidermis. Mouth ovate or oblong, oblique ; peristome thin, disunited.

Animal bulky, head with four tentacles, the upper ones stout and inflated, the lower ones very short. Foot very large. Dentition intermediate in character between *Helix* and *Vitrina*.

The shells of the amber-snails resemble *Lymnei* in shape; the animal however is very different. Species of this genus are found, for the most part in damp and wet places, all over the world, and bear so close a resemblance to each other, that it is very difficult to pronounce with certainty on the distinctness of many of them.

S. putris, Linnæus.

Spire small, aperture oblique.

Plate CXXXI. fig. 1—5.

Helix putris, Linn. Syst. Nat. ed. 12, p. 1249.—Mont. Test. Brit. p. 376, pl. 16, f. 4. — Donovan, Brit. Shells, vol. v. pl. 168, f. 1. — Dorset Catalog. p. 56, pl. 18, f. 19. — Gmel. Syst. Nat. p. 3659. — Sturm, Deutsch. Fauna, sect. vi. pt. 1, pl. 16.—Férus. Prodrom. Moll. 9; Hist. Moll. pl. 11, f. 4, 6, 7, 8, 9 (Cochlohydra).

„ *succinea*, Müller, Hist. Verm. pt. 2, p. 97.—Turt. Conch. Diction. p. 67. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 218. — Chemn. Conch. Cab. vol. ix. pt. 2, p. 178, pl. 135, f. 1248.

Bulimus succineus, Bruguière, Encyclop. Méth. Vers, vol. i. p. 308.

„ *limosa*, Pulteney, Hutchins, Hist. Dorset. App. p. 48.—Dillw. Recent Shells, vol. ii. p. 966.

Succinea amphibia, Draparn. Tableau Moll. p. 55; Moll. Ter. et Fluv. France, p. 58, pl. 3, f. 22, 23.—Turt. Manual Land and F. W. Shells, p. 91, f. 73. — Cooper, Mag. N. H. (ed. Charlesworth) vol. ii. p. 477, partly. — Brown, Illust. Conch. G. B. p. 35, pl. 15, f. 41, 42. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 316. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 67, pl. 3, f. 36, 37, 38; pt. 3, p. 55. —Blainv. Manual Malacol. p. 455, pl. 38, f. 4.—Desh. Annales Sc. Nat. xxii. p. 345 (anatomy).—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 91, f. 45. — Charpent. N. Denks. Schweiz. Ges. Nat. i. (1837) p. 4. —Swains. Malac. p. 328, f. 96.—Sowerby, Conch. Man. f. 265.—Reeve, Conch. Systemat. vol. ii. pl. 180, f. 3.— Philippi, Moll. Sicil. vol. ii. p. 102. — Morelet, Moll. Ter. et Fluv. Portugal, p. 52, pl. 5, f. 2.

Tapada putris, Studer, Verz. Schweiz. Conch. p. 11.

Amphibina „ Hartm. Neue Alpina, vol. i. p. 247.

Lymnea succinea, Fleming, Encycl. Edin. vol. vii. pt. 1, p. 77.

Succinea putris, Fleming, Brit. Anim. p. 267 (not var.).—Gray, Manual Land and F. W. Shells, p. 178, f. 73. — Macgilliv. Moll. Aberd. p. 95 (not var.).—L. Pfeif Monog. Helic. vol. ii. p. 514

Variety, *gracilis*.

Succinea amphibia, Nillson, Moll. Sueciæ, Ter. et Fluv. p. 41.

„ „ *var. β.* Cooper, Mag. Nat. Hist. (ed. Charlesworth) vol. ii. p. 477, in part.—Philippi, Moll. Sicil. vol. i. p. 142.

Helix putris, var. Férus. Hist. Moll. Ter. et Fluv. pl. 11, f. 13 (Cochlohydra).

Succinea oblonga, Leach (not Drap.) in Turton, Man. Land and F. W. Shells, p. 92, pl. 4, f. 74.—Bean, in Trans. Soc. Nat. Hist. Northumb. vol. i. p. 31. — Brown, Illust. Conch. G. B. pl. 18, f. 21.

Amphibulina putris, var. Hartm. in Sturm. Deutsch. Fauna. sect. vi. pt. 8, pl. 6, 7.

Succinea Pfeifferi, Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 92, f. 46. Gray, Manual.—Philippi, Moll. Sicil. vol. ii. p. 102. — L. Pfeif. Monog. Helic. vol. ii. p. 515.

„ *Levantina*, Desh. Expéd. Scient. Morée, Mollusq. p. 170, pl. 19, f. 25, 26, 27.— Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 317. —Cantraine, Mém. Acad. Brux. vol. xiii., and Malac. Méditer. p. 154.

„ *gracilis*, Alder, Mag. Zool. and Bot. vol. ii. p. 106; Trans. Soc. Nat. Hist. Northumb. vol. ii. p. 339.— Brown, Illust. Conch. G. B. p. 35, pl. 15, f. 34, 35, and var. pl. 18, f. 22, 23.

„ *putris, var. gracilis*, Macgilliv. Moll. Aberd. p. 96.

We are induced, by the examination of a large number of examples, collected from various and remote localities, and more particularly by the interesting series kindly communicated to us by Mr. Alder, to re-unite the *S. Pfeifferi* to this species. It is easy to pick out certain individuals, which unite in themselves all the peculiarities of character from which the variety (for such we hold it) has been regarded as specifically distinct, but a still larger proportion of specimens exist, which, from their mixed characteristics, can be assigned with certainty to neither form; and these connecting links (not mere hybrids, but living in separate little communities) forbid, as we conceive, any essential separation of the forms of common *Succinea*.

The shell is very thin, pellucid, glossy or lustrous, and of an uniform tint that ranges from rufous orange, through amber and yellow to pale straw colour. The shape varies from ovate-conic or oval-acute to narrow oblong conic: the surface exhibits neither folds, spiral sculpture, nor reticulations, but is more or less manifestly marked with crowded wrinkles of increase. The whorls, whose apex is small, but not acute, are from three to three and a half in number, of rapid longitudinal increase, taper above, rounded below; and in the more produced or slender form, are for the most part planulate or even a little subretuse beneath the strongly pronounced suture, which latter, by the amount of its obliquity and occasional final deflection, modifies greatly the general contour; the slant is least in short-spired ventricose examples. Five-sevenths of the dorsal length, sometimes even four-fifths, more rarely only three-fifths, are occupied by the body-whorl, whose basal declination is more or less rounded and gradual. The aperture, which is contracted above, and broadly rounded below, ranges from ovate to elongated ovate according to the general shape; it is moderately large for the genus, filling from half to at most two-fifths of the ventral area. The outer lip does not project abruptly above, and is more arcuated below than above. The pillar lip in the broader examples is moderately arcuated, in the narrower ones is more frequently straightish. Large individuals attain to three quarters of an inch in length.

The form *amphibia* is oval, more or less swollen, and of a more pallid and less rufous yellow than in the succeeding variety. Its whorls are typically much rounded; its suture not peculiarly oblique; and its spire never elongated. The mouth is ovate, fills about two-thirds of the length, and does not recede much at the anterior extremity. The pillar is more or less curved.

In the slender and often compressed *Pfeifferi* the shape is oblong-conic; the growth, as indicated by the slanting suture, very oblique; and the colouring, though occasionally dirty yellow, oftentimes reddish amber. The whorls (barely three in number) are never ventricose, are flattened above, and rounded below; their apex is peculiarly minute. The aperture is much elongated, and recedes considerably below: the inner lip is more or less straight.

In the variety *intermedia*, whose aspect presents the modified peculiarities of either of the preceding extreme forms, there are three and a half coils, so that the spire is occasionally more elongated in proportion than in *Pfeifferi* or *amphibia*.

The animal of the form *amphibia* is usually pale and often of a yellowish hue, mottled with dusky, and striped darkly down the centre of the neck; the tentacula are very stout at their bases, and very pale; the tail is obtuse and expanded. That of the form *gracilis* is usually much darker, often bluish black on the neck and sides, with paler foot, tail, and tentacula. Mr. Spence Bate thinks that he has made out some differences in the shapes of the lingual teeth. The animal of the intermediate form is often of a hyaline violet hue, or greenish. All the varieties live in wet places, among herbage on the banks of rivers, and by the side of pools and lakes. They seem to be distributed indifferently throughout the British islands. Our friend, Mr. Pickering, who has paid much attention to the distinctive features and habits of British land and freshwater shells remarks on some specimens of the two leading varieties taken in the neighbourhood of Hoddesdon, Herts, that *putris* occurs "on the grass in damp meadows; *gracilis*, on aquatic plants and mud by the sides of streams and ditches; the former may occasionally be met with in the same situations as the latter, but I have never met with *gracilis* in those in which *putris* is usually found, *i.e.*, in damp meadows. The difference of habitat and the widely different form and character of the two shells induce me to consider them as distinct species, having the same affinity to each other as *Limnæus auricularius* and *pereger*. I have frequently met with *gracilis* on the plants growing in brackish water in which *Assiminea* and *Rissoa* congregate, but never *amphibia*." Mr. William Thomson informs us that he finds the slender variety on the stems and leaves of plants at Battersea, which are immersed at every tide. M. Bouchard-Chantereaux observes that the young of *Succinea putris* attain their majority by the end of their first year. The eggs are globular, yellowish and hyaline, and are found adhering to plants and stones in agglutinated masses.

S. OBLONGA, Draparnaud.

Acutely ovate, with ventricose whorls, prominent spine and obovate scarcely oblique aperture.

Plate CXXXI. fig. 6, 7.

Succinea oblonga, DRAP. Tableau Moll. p. 56; Hist. Moll. p. 59, pl. 3, f. 24, 25. —JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 325, 505. —ALDER, Mag. Zool. and Bot. vol. ii. p. 106.—LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 317. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 68, pl. 3, f. 39; pt. 3, p. 56. —DESH. Encycl. Méth. Vers, vol. ii. p. 20. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 92, f. 47. — CHARPENT. N. Denks. Schweiz. Ges. Nat. vol. i. p. 3. — L. PFEIF. Monog. Helic. vol. ii. p. 516.

Helix elongata, FÉRUS. Prodr. Moll. 10; Hist. Moll. pl. 11, f. 1, 2 (Cochlohydra).

Amphibina oblonga, HARTM. in Neue Alpina, vol. i. p. 248.

Amphibulina „ HARTM. in Sturm. Deutschl. Fauna, sect. vi. pt. 8, pl. 8, 9.

Succinea arenaria, BOUCHARD-CHANTEREAUX, Mem. Soc. d'Ag. de Boulogne, 2nd ser. vol. i. p. 190. — POTIEZ and MICHAUD, Galerie Douai, Moll. vol. i. p. 67, pl. 11, f. 3, 4.

Shell acutely ovate, scarcely if at all oblique, thin but not peculiarly so, not much shining externally, pellucid, with inconspicuous crowded striulæ, but without distinct foldlike wrinkles, of a reddish horn or rufous amber colour, sometimes pale and whitish. Whorls three and a half to four, particularly tumid, abruptly rising from the profoundly impressed sutures; antepenult whorl, when viewed from the lower side of the shell, equal to either half or more than half the succeeding one: spire rather elongated for the genus. Epidermis often thick. Aperture subovate or oboval, not oblique, not acuminated above, hardly occupying more than half the entire length of the shell, rounded and not produced, nor attenuated at the base: outer lip arcuated, inner lip moderately subarcuated.

Length scarcely the quarter of an inch. Easily distinguishable from its small size, and short aperture.

Animal varying from pale to dusky or quite black, stout, and rather broad, with pale tentacles, and a short ovate foot.

This shell appears to have been anciently much more abundant in England than it now is, since we find it contained in considerable numbers in superficial deposits around London, and in the eastern counties. It is rare now, and very local. Mr. Jeffreys discovered it near Swansea. In Scotland it has been found near Glasgow by Mr. Kenyon. In Ireland it has occurred in the south, near Baltimore, to Mr. M'Andrew, who found it along with *Balæa fragilis* under the stones of a dry wall, and near Cork to Mr. S. Wright, jun., and Mr. Isaac Carroll.

It lives in sandy places, as among dunes by the seaside, as well as inland. We have found it plentiful beneath the bark of willows on sandy ground near the sea at Elsinore in Denmark (E. F.). M. Bouchard-Chantereaux, who supposed it to be distinct from the *oblonga* of Draparnaud, observes, that near Boulogne it inhabits the dunes, constantly covering its shell with a viscous secretion, and, in winter, buries itself in the sand.

LIMNÆADÆ.

The fresh-water pulmoniferous snails constitute a very natural family, the animals of all bearing a great similarity to each other, and being similarly organized. All have short broad snouts, and two tentacula of considerable size, either triangular or subulate in shape, with eyes placed at their inner bases. Their tongues are armed with rows of numerous quadrate hooked denticles. Their shells are very variously shaped, spiral, and turreted, dextral or sinistral, discoid and even patelliform. They have no operculum. They live in lakes, ponds, pools, ditches and, though not so abundantly, in rivers; occasionally they are found in brackish waters. They crawl on the mud and stones at the bottom, or on water plants, and in warm sunny weather ascend to the surface, and creep, as it were, reversed on the surface of the water, as if the film of water immediately in contact with the air was in a different condition from the fluid beneath, and served as a floor or ceiling, along which these mollusks progress. They lay their eggs in consistent transparent gelatinous masses on the leaves and stems of water plants, or on stones.

The characteristic forms of the generic types of this family have undergone very little change in the course of time since the earliest appearance of the group as yet traced. We find *Limnæadæ* in the fresh-water strata of the oolitic epoch strikingly resembling those which inhabit the pools and ditches of Britain at the present day.

PHYSA. Draparnaud.

Shell thin, spiral, ovate, oblong, subglobose, sinistral, smooth, polished; mouth with the base entire, the columella more or less contorted.

Animal with two long subulate or setaceous tentacula; eyes at their inner bases. Foot lanceolate.

The British species of this genus have been referred to two genera, *Physa* and *Aplexus*. The animal of the former has a dilated mantle with lobed edges; that of the latter has a simple mantle. We believe these to be specific, or at best sectional distinctions; they should at least be regarded as such until the characters of the animal in the majority of exotic species have been carefully examined. The genus *Physopsis* differs from *Physa* as *Achatina* differs from *Bulimus*, having the base of the columella truncated. It is South African: there are no European species. Fossil *Physæ*, closely resembling existing forms, are common in the Purbeck strata in Dorsetshire.

P. fontinalis, Linnæus.

Oval: spire very short and obtuse.

Plate CXXII. fig. 8, 9.

Bulla fontinalis, Linn. Syst. Nat. ed. 12, p. 1185. — Pult. Hutchins, Hist. Dorset, p. 40.—Mont. Test. Brit. vol. i. p. 226; Suppl. p. 96. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 126.— Rack. Dorset Catal. p. 43, pl. 21, f. 6. — Turt. Conch. Diction. p. 26. — Dillw. Recent Shells, vol. i. p. 487. — Wood, Index Testac. pl. 18, f. 37.

Turbo adversus, Da Costa, Brit. Conch. p. 96, pl. 5, f. 6.

Planorbis bulla, Müller, Verm. Hist. vol. ii. p. 167.

Bulinus perla, Müller, Naturforsch. 1781, vol. xv. p. 6, pl. 1.

Physa fontinalis, Drap. Moll. Ter. et Fluv. France, p. 54, pl. 3, f. 8, 9. — Fleming, Brit. Animals, p. 276. — Turt. Manual L. and

F. W. Shells, p. 127, f. 110. — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 379.—Gray, Manual L. and F. W. Shells, p. 251, pl. 9, f. 110.—Macgil. Moll. Aberd. p. 112. — Brown, Ill. Conch. G. B. p. 30, pl. 14, f. 5455. — Brard, Coq. Paris, p. 167, pl. 7, f. 7, 8.—Sturm. Deutsch. Fauna, sect. 6, pt. 4, pl. 10. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 94, pl. 4, f. 28.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 399. — Kickx, Moll. Brabant. p. 54. — Philippi, Moll. Sicil. vol. ii. p. 120.—Küst. Conch. Cab. i. sect. 17, pl. 2, f. 14, 15, 16. — Cantraine, Mém. Ac. Sc. Brux. vol. xiii. p. 163.—Stein, Schnecken Berlins, pl. 2, f. 6.

Helix Bullaoides, Donov. Brit. Shells, vol. v. pl. 168, f. 2, probably,* from which Maton and Rack. Trans. Linn. Soc. vol. viii. p. 223.

Bulla fulviatilis, Turt. Conch. Diction. p. 27.

Limnea fontinalis, Sowerby, Genera Shells, Lim. f. 8. — Reeve, Conch. Syst. vol. ii. pl. 192, f. 8.

Shell oval or abbreviated oval, with a very short spire, which only fills about a fifth of the dorsal length, tapers quickly and convexly to its obtuse apex: more or less transparent, extremely thin and fragile, highly polished, smooth or nearly so (yet sometimes with rather strong longitudinal wrinkles), and of a slightly and palely olivaceous yellowish horn-colour, becoming pallid in the larger examples. Whorls four to five, simply but decidedly convex, neither angulated nor planulately shelving below the fine suture, which becomes more slanting between the last two turns; superior volutions very short, of moderately fast longitudinal increase; body ventricose, its basal declination moderately rounded, yet not abrupt. Mouth lanceolate-subpyriform, capacious, filling almost one-half of the ventral area, and from three-fourths to four-fifths of the total length, dilated below, where it projects anteriorly, gradually contracted above by the swell of the body to a very acute curved peak. Outer lip sharp, prominent, subarcuated, not expanded, nor marginated; its edge not sinuated, advancing above, receding below. Columella white, narrow, only a little twisted, forming an obtuse angle by its comparative straightness with the obliquely arcuated upper outline of the inner lip. No vestige of an umbilical chink. Size of a large individual one-third of an inch long, nearly a quarter of an inch broad. The variety *acuta* is larger, with the spire more elongated, so that the aperture fills only two-thirds of the ventral length.

---

* The expression "ovate, spire short," modifies the ideal of the figure, which exhibits a rather more elongated spire, and is narrower than is usual in *fontinalis*.

The rare long spired variety (f. 10), may possibly prove a distinct species, and, assuredly, differs as much from the typical form as many of the supposed species of *Physæ* do from each other. Yet in that event, we should be unable to allocate those examples of *fontinalis* which only differ from the type by the greater projection of their spire.* It is the shell represented by Maton and Rackett, in the Linnean Transactions (vol. viii., pl. 4, f. 1), as *B. fontinalis*, and is the *Physa fontinalis*, var. 1, of Gray (Manual L. and F. W. Shells, p. 251, pl. 11, f. 110, *a*), and, in all probability, the same species, var. 2, of Brown,†), Ill. Conch. G. B., p. 30, pl. 14, f. 83, 84. It is a narrower shell than the typical form, is more obliquely coiled, and, consequently, has a more produced spire. The penult whorl appears peculiarly developed, the apex is decidedly blunt, the aperture fills at times but five-eighths of the total length, and the pillar is short and twisted. The original individuals were obtained from Anglesea, in 1833, but afterwards bred in a water-butt, which unusual habitat may have changed the aspect of their progeny.

---

* The following observation of Mr. Gray, in his excellent edition of Turton's "Manual," merits the attention of every naturalist:—"Mr. Hinch informs me, the first variety is always found in very small plashes of water, or in water among grass, while the larger one is found in canals or nearly still rivers, which may account for the difference between them; for we have often been inclined to consider varieties as distinct, because they were found in different situations, *whereas the difference of situation may be the only cause of the variation.*"

† Not his *P. acuta*, pl. 14, f. 58, 59, which is copied from Draparnaud (Moll. France, pl. 3, f. 10, 11), and has an acute apex and very short spire (p. 30). We have no proofs that that species has ever been found in Great Britain. The erroneous introduction of it occurred through the supposed identity of the examples queried for *acuta* by Mr. J. Sowerby (one of whose specimens we have figured, with the true *P. acuta* of the French conchologist.

The animal is of a pale yellowish grey, darkening in individuals to a deep fuscous hue. Its tentacles are long and slender, with conspicuous black eyes at their inner basis. The mantle is highly contractile, and when expanded envelopes a great part of the shell, and is divided at the edge into finger-like processes. It is bilobed, the columellar division having more digitations (usually five), than that which is projected over the spire. The foot is obtusely angled in front and pointed behind. It does not appear that there are any essential differences distinguishing the animals of the different varieties. They all advance with a jerking motion.

This pretty mollusk is common in pools, lakes, and ditches throughout the greater part of the British islands, ceasing, probably, only in the extreme north. Both large and small varieties occur in most districts.

P. HYPNORUM, Linnæus.

Oblong-conical: spire pointed, elongated.

Plate CXXII. fig. 6, 7.

Bulla hypnorum, LINN. Syst. Nat. ed. 12, p. 1182. — MONT. Test. Brit. p. 228. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 127. pl. 4, f. 3. — RACK. Dorset Catalog. p. 43, pl. 18, f. 20. — TURT. Conch. Diction. p. 488.—CHEMN. Conch. Cab. vol. ix. pt. 1, p. 34 (in part), pl. 103, f. 883, a, b. — DILLW. Recent Shells, vol. i. p. 488.—WOOD, Index Testac. pl. 18, f. 39.

Planorbis turritus, Müller, Verm. Ter. et Fluv. vol. ii. p. 169.

Helix marmorata, Gmel. Syst. Nat. p. 3665 (from Schröt. Flüsc. p. 269, pl. 6, f. 9.)

Physa hypnorum, Drap. Moll. Ter. et Fluv. France, p. 55, pl. 3, f. 12, 13. — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 381. — Brown, Ill. Conch. G. B. p. 30, pl. 14, f. 60, 61.—Voith. in Sturm. Deutsch. Fauna, sect. 6, pt. 4, pl. 11. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 97, pl. 4, f. 29, and animal, pl. 1, f. 12. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 400. —Nills. Moll. Sueciæ Ter. et Fluv. p. 57. — Kickx, Moll. Brabant. p. 53. — Charpent. Cat. Moll. Suisse, pl. 2, f. 12. — Cantr. Mém. Ac. Brux. vol. xiii. p. 162. — Gras. Moll. Ter. et Fluv. France, p. 60, pl. 4, f. 41.—Küster, Conch. Cab. i. sect. 17, pl. 2, f. 9 to 13.—Stein, Schneken Berlins, pl. 2, f. 7.

Limnæa turrita, Sowerby, Genera Shells, Lim. f. 10. — Reeve, Conch. Syst. vol. ii. pl. 192, f. 10.

Aplexa hypnorum, Fleming, Brit. Anim. p. 276.

Aplexus „ Gray, Manual Land and F. W. Shells, p. 255, pl. 9, f. 113.—Walker, Test. Min. Rar. f. 54.

Shell of a narrow oblong-conic shape, thin, lustrous, smooth, of a dark-yellowish horn-colour, marked occasionally at the stages of growth with a ferruginous line. Body sub-cylindraceous in the middle, by no means ventricose, with a convex and gradual anterior declination. Spire filling three-sevenths of the dorsal length, of five tapering turns, that are barely convex, of moderately fast longitudinal increase, occasionally white beneath the slanting suture: penult volution rather large, moderately high: apex very blunt, and little elevated. Mouth oblong-lanceolate, being very bluntly (often indeed subtruncately) rounded below, gradually and very acutely peaked above, filling rather more than half of the total length, and between a third and a fourth only of the ventral area. Outer lip curling a little inwards, ferruginous at the simple edge, which recedes rather suddenly below, not prominently arcuated above, rounded below. Columella white or pink, short, solid, not broad, somewhat raised, not forming a decided angle with the outline above it. No vestige of an umbilical chink. Ordinary size, half an inch (occasionally nearly three quarters) (Mont.) long; two lines and a half broad.

A specimen forwarded to us from Ohio as the *P. elongata* of Say (Journ. Ac. N. S. Philad. ii. p. 171) is, except in superior size, precisely identical; others from Massachusetts (Gould, Inv. Mas. p. 214, f. 143) differ only in the volutions being more convex, and of a more olivaceous cast.

The animal is of a deep brown, or nearly black hue, with paler tentacles, which are subulate, slightly compressed, and not auriculated at their bases. The mantle is simple-edged, and not reflected over the shell. The foot is lanceolate.

This species, though generally diffused throughout England and Ireland, is somewhat local, and in Scotland occurs only in the southern and midland districts.

SPURIOUS.

P. RIVALIS, Maton and Rackett.

Bulla rivalis, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 126, pl. 4, f. 2.—MONT. Test. Brit. Suppl. p. 97. — TURT. Conch. Diction. p. 26 (in part).—DILLW. Recent Shells, vol. i. p. 488.
Aplexa „ FLEMING, Brit. Anim. p. 277.
Physa „ TURT. Manual Land and F. W. Shells, p. 128, f. 112 (copy from Linn. Trans.).
Limnea „ SOWERBY, Genera Shells, Lim. f. 9.— REEVE, Conch. Syst. vol. ii. pl. 192, f. 9.
Physa Soverbiana, D'ORBIG. H. N. Cuba, Moll. pl. 13, f. 11, 12 (probably).
Aplexus rivalis, GRAY, Manual Land and F. W. Shells, p. 21 (as spurious).

A West Indian species, introduced by Maton and Rackett, as from Hampshire. The P. Antonii *of Küster's "Conchilian Cabinet" (i. sect.* 17, *p.* 12, *pl.* 2, *f.* 7, 8*) appears to be most closely allied, if not identical.*

P. ACUTA, Draparnaud.

Physa acuta, DRAP. Moll. Ter. et Fluv. France, p. 55, pl. 3, f. 10, 11.—BROWN, Ill. Conch. G. B. pl. 14, f. 58, 59 (copied from Drap.).—BRARD, Coq. Envir. Paris, p. 69, pl. 7, f. 5, 6.—MICHAUD, Comp. Drap. Moll. France, pl. 16, f. 19, 20.—D'ORBIG. Moll. Canar. p. 74.—DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 403.—MERMET, Moll. Pyren. p. 70.

„ *subopaca*, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 401 (teste Michaud).

A southern Continental species, figured by Brown for the P. fontinalis, *var.* acuta.

P. ALBA, Turton.

Physa alba, TURT. Zool. Journ. 1825, vol. ii. p. 363, pl. 13, f. 3; Manual Land and F. W. Shells, p. 128, f. 11.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 521.)

„ *contorta*, MICHAUD, Bull. Linn. Soc. Bordeaux, 1829, vol. iii. p. 368 (from which Esp. Nouv. Coq. 1829, p. 9, pl. 1, f. 15, 16; Comp. Drap. Moll. France, p. 83, pl. 16, f. 21, 22).

Diastropha „ GRAY, Manual Land and F. W. Shells, p. 16, f. 111, as spurious (no description).

Physa fontinalis, BROWN, Ill. Conch. G. B. p. 30, pl. 14, f. 56, 57.

A native of Southern Europe and Northern Africa, introduced by Turton as from the river Torvin, in Wales.

PLANORBIS. MÜLLER.

Shell spiral, discoid, dextral, of many whorls; aperture elliptical or semi-lunar, margin entire.

Animal with a stout, broad, proboscidiform head, flanked by two setaceous, or subulate tentacula, with eyes at their inner bases. Foot short, obtuse behind. Tongue with transverse rows of numerous quadrate uncinated teeth.

This very natural genus, representatives of which differing but slightly from species still living, are found in fresh-water strata of even the oolitic epoch, has preserved its form with great constancy, nor do the members which are natives of tropical climates, differ materially in general contour and ornament, from those found in temperate regions.

P. CORNEUS, Linnæus.

Large, stout, with rounded ventricose whorls; upper disk concave, lower plane.

Plate CXXVI. fig. 4, 5.

Helix cornea, LINN. Syst. Nat. ed. 12, p. 1243.—PENN. Brit. Zool. ed. 4, vol. iv. p. 134, pl. 83, f. 126.—PULTENEY, Hutchins, Dorset, p. 47.—DONOV. Brit. Shells, vol. ii. pl. 39, f. 1.—MONT. Test. Brit. p. 448,—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 190.—Dorset Catalog. p. 52, pl. 20, f. 13.—TURT. Conch. Diction. p. 47, f. 52.—CHEMN. Conch. Cab. vol. ix. pt. 2, p. 93 (in part), pl. 127, f. 1113, 1114.—DILLW. Recent Shells, vol. ii. p. 906.—Index Testaceolog. pl. 33, f. 48.

Planorbis purpureus, MÜLLER, Hist. Verm. pt. 2, p. 154 (not var.).

„ *similis*, MÜLLER, Hist. Verm. pt. 2, p. 166 (young).

Helix nana, PENN. Brit. Zool. ed. 4, vol. iv. p. 133, pl. 83, f. 125 (young).

,, *cornu-arietis*, DA COSTA, Brit. Conch. p. 60, pl. 4, f. 13.

Planorbis corneus, DRAP. Moll. Ter. et Fluv. France, p. 43, pl. 1, f. 42, 43, 44.—FLEMING, Brit. Animals, p. 277.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 383.—TURT. Conch. Manual, p. 112, f. 95; ed. Gray, p. 258, pl. 8, f. 95.—BROWN, Illust. Conch. G. B. p. 31, pl. 14, f. 31, 32, 33.—BRARD, Coq. Paris, p. 147, pl. 6, f. 1, 2.—VOITH. in Sturm. Deutsch. Fauna, pt. 4, pl. 4.—LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 382.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 77, pl. 4, f. 3, 4.—NILS. Moll. Suec. Ter. et Fluv. p. 74.—BLAINV. Manual Malacol. pl. 37 bis. f. 3.—SOWERBY, Genera Shells, Plan. f. 1.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 2, p. 14, pl. 7, f. 113; pt. 1, pl. 5, f. 86 (animal).—CANTRAINE, Mem. Acad. Brux. vol. xiii. p. 164.—GRAS, Moll. Ter. et Fluv. France, p. 57, pl. 4, f. 31.—DUPUY. Moll. Gers, p. 46.—STEIN, Schnecken Berlins, pl. 2, f. 15.

Planorbe cornée, CHENU, Traité Elém. Conch. p. 167, f. 541, 542.

Shell large, rather strong, glossy, from greyish olive to ferruginous olive (more rarely pallid), not quite thrice as broad as high, with only irregular wrinkles of increase, and very fine close-set spiral striæ, that are chiefly apparent on the smaller turns. Whorls five, deeply divided, rounded, neither angulated nor planulate on either side, of moderately fast increase. Upper disk much and abruptly sunken in the middle; lower disk flattish. Body about equally broad above and below, not peculiarly contracted towards the mouth; its lower shelve rather the more slanting; its periphery neither keeled nor obtuse, but well rounded. Mouth rather large, filling about a third of the breadth, of a rounded lunate figure, not particularly oblique, quite as high as broad, much receding below, often stained with purplish smoke-colour, very slightly beyond the level of either disk. Outer lip neither expanded, thickened, nor strictured behind, its junction with the pillar arched, not angular. Breadth an inch; height, four lines and a half.

Young shells are conspicuously spirally striated, and in that state have been regarded as a distinct species.

The animal is nearly black, with a tinge of brown. Its tentacles are bluish-black. When irritated it gives out a purple fluid.

This fine species is abundant in canals, ponds, ditches, and slow-running streams in the south-east, east, and middle of England, but becomes rare and disappears before reaching Scotland. Its northernmost recorded locality is Darlington (Alder.) It is absent from Cornwall and Devon, and is not found in the Isle of Man. Mr. E. J. Lowe has remarked that it attains a peculiarly large size in a dirty ditch at Nottingham, into which a constant supply of warm water runs. Weston-super-Mare (T. Hincks). In Ireland it was first noticed near Maynooth, in Kildare, by Captain Brown. It occurs also about Naas (R. Ball); and in Queen's County (Rev. B. J. Clark). A white variety occurs in the neighbourhood of London.

P. ALBUS, Müller.

Small, rather depressed, slightly convex on both disks, whorls with decussating striæ, and pilose.

Plate CXXVI. fig. 1, 2.

Planorbis albus, MÜLLER, Hist. Verm. pt. 2, p. 164.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 387.—FLEMING, Brit. Anim. p. 279.—TURT. Manual L. and F. W. Shells, p. 114, f. 97. — GRAY, Manual L. and F. W. Shells, p. 259, pl. 8, f. 197.—MACGILLIV. Moll. Aberd. p. 119. — BROWN, Illust. Conch. G. B. p. 31, pl. 14, f. 52, 53.—C. PFEIF. Deutsch. Land und Süsw. Moll. pt. 1, p. 80, pl. 4, f. 9, 10. — DUPUY, Moll. Gers, p. 47. — STEIN, Schnecken Berlins, pl. 2, f. 23.

Helix alba, MONT. Test. Brit. p. 459, pl. 25, f. 7. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 192.— Dorset Catalog. p. 53, pl. 19, f. 18.—TURT. Conch. Diction. p. 48.—DILLW. Recent Shells, vol. ii. p. 909.

Planorbis hispidus, DRAP. Moll. Ter. et Fluv. France, p. 43, pl. 1, f. 45 to 48.—BRARD, Coq. Paris, p. 159, pl. 6, f. 6, 7. — VOITH in Sturm. Deutsch. Fauna, pt. 4, pl. 5. — LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 387. — NILS. Moll. Sueciæ Ter. et Fluv. p. 75. — KICKX, Moll. Brabant. Austral. p. 64. — GRAS, Moll. Ter. et Fluv. France, p. 57, pl. 4, f. 32. — MERMET, Moll. Pyrén. p. 59.

„ *hirsutus*, GOULD, Invert. Massach. p. 206, f. 135 ?

Gyraulus hispidus, HARTM. Erd und Süssw. Gaster. pl. 25.

Shell small, pale horn-coloured, rather depressed (about thrice as broad as high), very thin, not much polished. Upper disk flattish, slightly sunk, quite in the centre; concavity of lower disk more extended, not profound. Whorls four or five, deeply divided, simply and moderately rounded, of tolerably fast increase, not peculiarly narrow, adorned with fine close-set raised spiral lines that are decussated by still finer and more crowded spiral ones, and are clothed, when recent, with a deciduous pile. Body decidedly broader than high, about equally wide on either disk; its slopes nearly equal; rather narrowly rounded at the periphery, at times assuming a subcarinated appearance from the greater prominence of one of the spiral lines. Mouth oboval-lunate, peculiarly receding below, rather large, filling more than a third of the breadth, quite as broad as high, not peaked below, where it projects slightly beyond the level, slightly beneath the level above. Outer lip acute, a little disposed to expand, curving to the pillar without angularity. Diameter a quarter to a fifth of an inch.

The animal is variable in colouring. Individuals which we have taken near London, are of a pale ashy grey, with black head and neck, and very pale tentacles; those we have gathered in ditches among the peat bogs in the Isle of Man are of a general reddish-yellow colour, darkening to red on the neck and head, and shining red through the body whorls; and Mr. Spence Bate has communicated a drawing, taken from specimens at Swansea, in which the head, neck, and tentacles of the animal are represented of a brownish white, and the sides of foot and proboscis, of a deeper brown. The colouring of Scottish specimens described by Mr. Macgillivray, is also somewhat different.

It lives on water-plants, especially *Potamogeton*, and is widely distributed through the British Islands; so generally, indeed, that any enumeration of localities would be superfluous.

P. GLABER, Jeffreys.

Small, depressed, not keeled, smooth or nearly so (no spiral sculpture), whorls of rather fast increase, mouth roundish.

Plate CXXVI. fig. 8, 9.

Planorbis glaber, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 387, teste Jeffreys.— POTIEZ and MICH. Gal. Douai, Moll. p. 211.

„ *lævis*, ALDER, Trans. Nat. Hist. Soc. Northumb. vol. ii. p. 337; Mag. Zool. and Bot. vol. ii. p. 113. — GRAY, Manual L. and F. W. Shells, p. 261, pl. 12. f. 148. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 121.—BROWN, Illust. Conch. G. B. p. 31.

Shell small, pale olivaceous horn-coloured, depressed, about three or four times as broad as high, very thin and semitransparent, glossy. Both disks, the left more particularly, moderately concave in the middle, the apex rather abruptly sunken. Whorls about four, very deeply divided, rounded, somewhat projectingly so upon the right disk, where the inner slope is much more abrupt, of fast increase, smooth, or at most only slightly wrinkled across. Body about as broad as high, equally wide on both disks; well rounded at the periphery, the slopes tolerably even, the lower, if anything, rather shorter and less convex. Mouth as in *albus*. Diameter two lines.

Mr. Jeffreys having forwarded to us examples of his P. *glaber*, and the characteristics of the species, agreeing with his published account of the distinctive features between it and *albus*, we are compelled to adopt the prior appellation. The P. *lævis* was published as new, because the specimen of P. *glaber* given to Mr. Alder by the author of the species, proved to be a variety of *albus*.

The animal is grey, dark about the head and sides of the neck, with pale tentacula, and a rather large foot for its size. Mr. Spence Bate has observed that the teeth have more strongly serrated margins to their hooks than those of *albus*.

This shell is local. It occurs near Penzance (R. T. Millet); near Falmouth (Cocks); in Staffordshire and Somersetshire, and in marshes on the sea-coast near Swansea, Cardiff, and Manorbeer, in Pembrokeshire (Jeffreys); in ponds at Whitley Quarries, and on Holy Island, Northumberland (Alder). In Ireland it occurs near Belfast (W. Thompson); and at Cork (J. D. Humphreys).

P. nautileus, Linnæus.

Very small, usually with membranaceous ridges; periphery angulated; mouth entire, rounded-oval.

Plate CXXVI. fig. 6, 7.

Helix Nautileus, Linn. Syst. Nat. ed. 12, p. 1241. — Mont. Test. Brit. p. 464, pl. 25, f. 5.

Planorbis imbricatus, Müller, Hist. Verm. pt. 2, p. 165. — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 388. — Turt. Manual L. and F. W. Shells, p. 111, pl. 8, f. 94. — Gray, Manual L. and F. W. Shells, p. 261, pl. 8, f. 94. — Brown, Illust, Conch. G. B. p. 31, pl. 14, f. 46, 47, and pl. 18, f. 10.— Drap. Moll. Ter. et Fluv. France, p. 44, pl. 1, f. 49, 50, 51. — Brard, Coq. Paris, p. 163, pl. 6, f. 10, 11. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 389. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 80. pl. 4, f. 15, 16. — Nils. Moll. Suec. Ter. et Fluv. p. 76. —Hartm. in Sturm. Deutsch. Fauna, pt. 7, pl. 14. — Kickx, Moll. Brabant. p. 67. — Mermet, Moll. Pyrén. p. 59.

„ *cristatus*, Drap. Moll. Ter. et Fluv. France, p. 44, pl. 2, f. 1, 2, 3.— Hartm. in Sturm. Deutsch. Fauna, pt. 7, pl. 13.—Mermet, Moll. Pyrén. p. 60.

Turbo Nautileus, Maton and Rack. Trans. Linn. Soc. vol. viii. p. 169, pl. 5, f. 4. —Rack. Dorset Catalog. p. 50, pl. 19, f. 16.—Turt. Conch. Diction. p. 227, f. 78.—Wood, Index Testac. p. 32, f. 162.— Dillw. Recent Shells, vol. ii. p. 882.

Planorbis Nautilus, Fleming, Brit. Anim. p. 278.

„ *Nautileus*, Dupuy, Moll. Gers, p. 51.—Stein, Schnecken Berlins, pl. 2, f. 24.—Walker, Testac. Minut. Rariora, f. 20, 21.

Shell very small, much depressed, very fragile, not lustrous, of a slightly olivaceous horn-colour, often invested with a black incrustation, adorned for the most part (for occasionally they are obsolete) with distant subimbricated longitudinal membranaceous rings, or ridges, which are usually more marked on the lower disk, and serrate the periphery by their projection as vaulted scales. Whorls three, very rapidly developed, profoundly divided, more convex on the lower disk, which is umbilicately hollowed, than on the upper disk, which is flat, or has the inner coils a little elevated. Body much less high than broad, nearly equally wide above and below, well rounded on the lower disk, and shelving upwards from thence so as to form a keel-like angulation with the superior flattened surface. Mouth rounded, oval, entire, occasionally detached from the preceding coil, broader than long, filling quite two-fifths of the total width, projecting below the basal level. Outer lip acute, disposed to expand. Diameter from an eighth to a tenth of an inch.

The animal is pale-grey.

This minute and elegant water-snail may be found on plants in ponds and ditches in most parts of England, Ireland, and the south and middle of Scotland. Aberdeen (Macgillivray); Isle of Man (E.F.).

P. CARINATUS, Müller.

Highly polished, smooth or nearly so, strongly carinated, and planulately depressed.

Plate CXXVII. fig. 4, 5.

Helix planorbis, LINN. Syst. Nat. ed. 12, p. 1242 (in part). — TURT. Conch. Diction. p. 45.—DILLW. Recent Shells, vol. ii. p. 896.

Planorbis carinatus, MÜLLER, Hist. Verm. pt. 2, p. 157. — FLEMING, Brit. Animals, p. 279. — TURT. Manual L. and F. W. Shells, p. 106, pl. 8, f. 89 (error for 87). — GRAY, Manual L. and F. W. Shells, p. 262, pl. 8, f. 89.—BROWN, Illust. Conch. G. B. p. 32, pl. 14, f. 35, 36, 37.— DRAP. Moll. Ter. et Fluv. France, p. 36, pl. 2, f. 13, 14, 16.—VOITH in Sturm. Deutsch. Fauna, pt. 3, pl. 5.— BRARD, Coq. Paris, p. 150, pl. 6, f. 3. — LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 383.— C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 76, pl. 4, f. 5, 6. — NILS. Moll. Suec. Ter. et Fluv. p. 81.—KICKX, Moll. Brabant. Austral. p. 65.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 102, pl. 2, f. 60.—CANTRAINE, Mém. Acad. Brux. vol. xiii. p. 166.—GRAS, Moll. Ter. et Fluv. France, p. 59, pl. 4, f. 39. —HARTM. Erd und Süssw. Gaster. pl. 31.—MERMET, Moll. Pyrén. p. 62.—STEIN, Schnecken Berlins, pl. 2, f. 19.

Helix carinata, MONT. Test. Brit. p. 451, pl. 25, f. 1.
„ *planata*, MATON and RACK. Trans. Linn. Soc. vol. viii. p. 189, pl. 5, f. 14. —Dorset Catalog. p. 52, pl. 20, f. 18.—WOOD, Index Testaceolog. pl. 33, f. 23.
Planorbis lutescens, JEFFR. (not Lam.) Trans. Linn. Soc. vol. xvi. p. 385, changed to *disciformis*, p. 521 (from type).
„ *planatus*, TURT. Manual L. and F. W. Shells, p. 110, f. 92.

Shell of an ashy horn-colour, moderately depressed, the height to the breadth being usually as one to five, more or less translucent, much shining, smooth, or nearly so. Upper disk rather deeply concave in the middle, lower disk flat. Whorls five, deeply divided, of rapid increase, simply rounded on the right disk, convex on the left one. Body decidedly broader than high, more especially on the upper disk, where it is peculiarly large in proportion to the preceding turn (so that a line drawn across it at one-third the circumference from the aperture is more than equal to the diameter of the remaining coils); encircled below the middle, but above the level of the lower disk, by a projecting keel-like rim, above which the rounded surface does not arch simply to the edge, but shelves towards it. Mouth somewhat rhomboidal, broader than high, rounded above and below, angulated laterally. Outer lip acute, projecting a little above the upper level, and only slightly disposed to expand there, scarcely extending beyond the lower level. Breadth half an inch.

In the variety *disciformis* the middle of the lower disk is almost convex, and the keel in consequence seems more central.

The animal is of a pale translucent yellowish hue, darkening to brown.

This is a local species, but widely diffused in England, and occurring in scattered localities in all our districts, probably becoming more common towards the east and south-east. It is generally diffused but very local also in Ireland (W. Thompson), where the variety *disciformis* occurs at Nenagh, in Tipperary (T. Hincks). It does not reach Scotland.

P. MARGINATUS, Draparnaud.

Less compressed than the last species, wrinkled and roughish, not polished, shallowly concave above, flat below, carinated.

Plate CXXVII. fig. 1, 2, and (var. *rhombeus*) fig. 3.

Helix planorbis, LINN. Syst. Nat. ed. 12, p. 1242 (in part). — PENNANT, Brit. Zool. ed. 4, vol. iv. p. 133, pl. 83, f. 123. — PULTENEY, Hutchins, Hist. Dorset, p. 46. — MATON and RACK. Trans. Linn. Soc. vol. viii. pl. 5, f. 13.—Dorset Catalog. p. 52, pl. 14, f. 8, and pl. 20, f. 10.

Planorbus umbilicatus, MÜLLER, Hist. Verm. pt. 2, p. 160.— JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 384. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 124.

Helix limbata, DA COSTA, Brit. Conch. p. 63, pl. 4, f. 10, and pl. 8, f. 8.

Planorbis marginatus, DRAPARN. Moll. Ter. et Fluv. France, p. 45, pl. 2, f. 11, 12, 15. — TURT. Manual L. and F. W. Shells, p. 107, f. 87. — ALDER, Mag. Zool. and Bot. vol. ii. p. 112. — GRAY, Manual L. and F. W. Shells, p. 265, pl. 8, f. 87, 88, 90. — BROWN, Illust. Conch. G. B. p. 32, pl. 14, f. 39, 40, 41.—BRARD, Coq. Paris, p. 152, pl. 6, f. 5.— C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 75, pl. 4, f. 1, 2.— NILS. Moll. Suec. Ter. et Fluv. p. 80. — KICKX, Moll. Brabant. Austral. p. 64. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 102, pl. 2, f. 59. —PHILIPPI, Moll. Sicil. vol. i. p. 145, and pl. 2, f. 119. — GRAS, Moll. Ter. et Fluv. France, p. 59, pl. 4, f. 38.— HARTM. Erd und Süssw. Gaster. pl. 33. — MERMET, Moll. Pyrén. p. 62.

Helix complanata, MONT. Test. Brit. p. 450, pl. 25, f. 4.—TURT. Conch. Diction. p. 46.— WOOD, Index Testaceolog. pl. 33, f. 24.— DILLW. Recent Shells, vol. ii. p. 897.

„ *Draparnaudi*, SHEPPARD, Trans. Linn. Soc. vol. xiv. p. 158 (fide Gray from type in Brit. Museum).

Planorbis turgidus, JEFFR. Trans. Linn. Soc. vol. xvi. p. 383.

„ *Draparnaldi*, JEFFR. Trans. Linn. Soc. vol. xvi. p. 386, 522.

„ *rhombeus*, TURT. Manual L. and F. W. Shells, p. 108, f. 90.

„ *complanatus*, FLEMING, Brit. Anim. p. 278.—TURT. Manual L. and F. W. Shells, p. 108, f. 88 (error for 89). — DESH. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 390. — CANTR.

Mém. Acad. Bruxelles, vol. xiii. p. 163. — STEIN, Schnecken Berlins, pl. 2, f. 18.

MONSTROSITIES, *Helix cochlea*, BROWN, Mem. Werner. Soc. vol. ii. pt. 2, p. 528, pl. 24, f. 10. — *Helix terebra*, TURT. Conch. Diction. p. 62, f. 55.—*Plan. marginatus, monst.* BROWN, Illust. Conch. G. B. p. 32, pl. 14, f. 38.

Shell brownish, or olivaceous horn-colour, usually covered with a black or ferruginous coating, not polished, merely a little glossed, moderately depressed (the height of the body, not of the orifice, being for the most part about a fifth, not quite so pellucid as in *carinatus*, finely, closely, and distinctly wrinkled across, the wrinkles assuming beneath a powerful lens a somewhat decussated appearance. Upper disk moderately and rather diffusely concave; lower disk almost flat, but indented in the middle. Whorls five, deeply divided, of moderate increase, not peculiarly narrow, prominently though simply rounded on the upper disk, merely convex on the lower one. Body not so vastly larger than the preceding coil (so that the diameter of the upper internal gyration, measured as in *carinatus*, greatly exceeds it in breadth), rather wider on the upper disk, about as high as it is broad, with a carinated rim at the periphery that is barely above the basal level; surface above the keel rather abruptly arched (not shelving), below it almost horizontally convex. Mouth bluntly quadrant-shaped, of about equal height and breadth. Outer lip acute (more rarely slightly thickened within), dilated above, where it decidedly projects beyond the level, neither peaked nor angulated below, where it scarcely, if at all, exceeds the general level. Breadth of a large individual five-eighths of an inch.

The keel, which in some examples is continued along the edge of the penult turn, is in others almost altogether obsolete. In the variety *rhombeus* the shell is higher than usual, with the gyration rather more compact, less concave on the upper disk, profoundly hollowed in the centre of the lower one: the keel being indistinct, the aperture which projects below rather than above is suborbicular. The form *Draparnaldi* somewhat resembles it, but is pallid, small, and with the keel more central.

The animal is entirely dusky, almost black; the tentacles have dark centres and pale linear bases; the foot is thick and obtuse.

This species in most districts is the commonest of the genus, and is very widely diffused through almost all parts of the British Islands; so general, that any list of localities would be superfluous. It is absent, however, from Professor Macgillvray's Aberdeenshire catalogue. It is widely diffused on the Continent.

P. VORTEX, Linnæus.

Extremely depressed; whorls narrow and of slow increase; the two disks not concave together; periphery gradually carinated, mouth not angulated.

Plate CXXVII. fig. 6, 7, 8.

Helix vortex, LINN. Syst. Nat. ed. 12, p. 1243.—PENN. Brit. Zool. ed. 4, vol. iv. p. 133, pl. 83, f. 124. — PULT. Hutchins, Hist. Dorset, p. 47. — DONOV. Brit. Shells, vol. iii. pl. 75. — MONT. Test. Brit. vol. ii. p. 454; Suppl. pl. 25, f. 3. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 189.—RACK. Dorset Catal. p. 52, pl. 20, f. 12. — TURT. Conch. Diction. p. 46. — DILLW. Recent Shells, vol. ii. p. 914.—WOOD, Index Testac. pl. 33, f. 40.

Planorbis „ MÜLLER, Verm. Hist. pt. ii. p. 158, var. a. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 382; Manual L. and F. W. Shells, p. 109, f. 91.— GRAY, Manual L. and F. W. Shells, p. 267, pl. 8, f. 91. — THOMPSON, Ann. Nat. Hist. vol. vi. p. 125. — MACGILLIV. Moll. Aberd. p. 114 (probably). — BROWN, Illust. Conch. G. B. p. 32, pl. 14, f. 44, 45.—DRAP. Moll. Ter. et Fluv. France, p. 44, pl. 2, f. 4, 5.—BRARD, Coq. Envir. Paris, p. 154, pl. 6, f. 8, 9.— VOITH in Sturm. Deutsch. Fauna, pt. 4, pl. 6. — C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 79, pl. 4, f. 7.—NILSS.

Moll. Suec. Ter. et Fluv. p. 79.—LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 385. — HARTM. in Sturm Deutsch. Fauna, pt. 8, pl. 13. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 104, pl. 2, f. 61.—CANTR. Mem. Ac. Brux. vol. xiii. p. 147.— GRAS, Moll. Ter. et Fluv. France, p. 59, pl. 4, f. 34. — STEIN, Schnecken Berlins, pl. 2, f. 20.

Helix planorbis, DA COSTA, Brit. Conch. p. 65, pl. 4, f. 12.

Planorbis compressus, MICHAUD, Compl. Drap. Moll. France, p. 81, pl. 16, f. 6, 7, 8.

Shell rather small, extremely depressed, of a glossy horn-colour, thin and transparent, regularly, closely, yet not very sharply wrinkled across. Upper disk broadly and rather deeply concave; lower disk flat (more rarely convex), occasionally, however, it is concave in the middle, in which event the upper disk is almost level. Whorls usually six (more rarely seven), deeply divided (especially above), well rounded on the superior disk, rather flat on the inferior one. Body broader above than below, not abruptly larger (as in a closely allied exotic species) than the preceding turn, gradually shelving (for the most part with little convexity), so as to form a more or less acute and projecting almost basal keel-like angulation; its upper or sutural slope more or less rounded, and rather sudden. Mouth unarmed, oblique, subcordate, angulated by the keel, decidedly broader than long, usually filling a fifth or rather less of the total width, neither expanded nor strictured externally. Diameter from a third to a fourth of an inch.

Animal pale yellowish grey, black about the head, and especially between the tentacles, which are very long, pale yellowish grey, and have the eyes at their bases with white spaces. The foot is very short as compared with the size of the shell.

Widely distributed in England, though scarce or absent in several districts. It is not included in the lists from

Northumberland or Cornwall. Dumfriesshire (Dr. Johnston and Sir William Jardine); Aberdeenshire (Macgillivray); near Dublin (W. Thompson).

P. SPIRORBIS, Linnæus.

Extremely depressed; whorls very narrow and of very slow increase; angulation of the periphery not acutely prominent; both disks concave; mouth not angulated.

Plate CXXVII. fig. 9, 10.

Helix spirorbis, LINN. Syst. Nat. ed. 12, p. 1244. — MONT. Test. Brit. p. 455; Suppl. pl. 25, f. 2. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 191.—RACK. Dorset Catalog. p. 53, pl. 20, f. 17.—TURT. Conch. Diction. p. 47. — DILLW. Recent Shells, vol. ii. p. 907.—WOOD, Index Testac. pl. 33, f. 50.

Planorbis „ MÜLLER (not Drap.) Verm. Hist. vol. ii. p. 161. — FLEMING, Brit. Anim. p. 277. — TURT. Manual L. and F. W. Shells, p. 115, f. 98. — ALDER, Trans. Nat. Hist. Soc. Northumb. vol. ii. p. 338. — GRAY, Manual L. and F. W. Shells, p. 268, pl. 8, f. 98.—BROWN, Illust. Conch. G. B. p. 33, pl. 14, f. 42, 43.—BRARD, Coq. Envir. Paris, p. 156, pl. 14, f. 42, 43. — C. PFEIF. Deutsch. L. und Süssw. Moll. pt. 1, p. 79, pl. 4, f. 8. —LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 385. —NILSS. Moll. Suec. Ter. et Fluv. p. 78. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 106, pl. 2, f. 61. —CANTR. Mém. Ac. Brux. vol. xiii. p. 166.

„ *vortex, var. b.* DRAP. Moll. Ter. et Fluv. France, p. 45, pl. 2, f. 6, 7.—MACGILLIV. Moll. Aberd. p. 117.

„ *leucostomus*, MICHAUD (as of Millet) Comp. Drap. Moll. France, p. 80, pl. 16, f. 3, 4, 5 (teste Thompson, from type).

Shell very closely resembling *vortex*, yet scarcely so compressed, and with both disks concave. The whorls, which on the inferior disk are much less flattened than in the preceding species, are less thin and transparent, often of a rusty brown, peculiarly narrow, and of still slower increase: the wrinkles are nearly obsolete. The body, likewise, is nearly equally broad above and below, and its shelve being more abrupt and rounded, the basal angulation, even when marked, does not acutely project. The mouth, likewise, which is still smaller in proportion to the total breadth, is as high as it is broad, and is of a much more rounded shape, not being angulated by a carina. Diameter a quarter of an inch.

Animal closely resembling the last.

In local lists it is difficult, where both species do not occur to separate this from the preceding. *P. spirorbis*, however, appears to be still more generally diffused, and to have a wide distribution through most districts of the three kingdoms.

P. CONTORTUS, Linnæus.

Whorls closely coiled, narrow, high; upper disk flattened, lower one deeply excavated; periphery rounded.

Plate CXXVI. fig. 3.

Helix contorta, LINN. Syst. Nat. ed. 12, p. 1244. — DONOV. Brit. Shells, vol. iii. pl. 99.—MONT. Test. Brit. p. 457; Suppl. pl. 25, f. 6.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 191. — RACK. Dorset Catalog. p. 53, pl. 20, f. 11. — TURT. Conch. Diction. p. 48. — DILLW. Recent Shells, vol. ii. p. 908. — WOOD, Index Testac. pl. 33, f. 52.

Planorbis contortus, MÜLLER, Verm. Hist. pt. ii. p. 162.—FLEMING, Brit. Anim. p. 277.—JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 382.—TURT. Manual L. and F. W. Shells, p. 113 (ed. Gray, p. 270), f. 96.—MACGIL. Moll. Aberd. p. 118.—BROWN, Illust. Conch. G. B. p. 33, pl. 14, f. 33, 34. — DRAP. Moll. Ter. et Fluv. France, p. 42, pl. 1, f. 39, 40, 41.—VOITH in Sturm. Deutsch. Fauna, pt. 3, pl. 4. —BRARD, Coq. Envir. Paris, p. 157, pl. 6, f. 12, 13, 14.—C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 81, pl. 4, f. 11. — LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 387. — NILSS. Moll. Suec. Ter. et Fluv. p. 73. — KICKX, Moll. Brabant. p. 63. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 2, p. 16, pl. 7, f. 117. — GRAS, Moll. Ter. et Fluv. France, p. 57, pl. 4, f. 30.—MERMET, Moll. Pyrén. p. 59.—STEIN, Schnecken Berlins, pl. 2, f. 25.

Helix crassa, DA COSTA, Brit. Conch. p. 16, pl. 4, f. 11.

„ *umbilicata*, PULT. Hutchins, Hist. Dorset, p. 47.

Shell small, brownish horn-colour, about thrice as broad as high, not much polished. Upper or right disk flattish, yet slightly concave in the middle, exhibiting six extremely narrow coils, that are of very slow increase, closely and most minutely wrinkled across, deeply divided by the suture, rounded, but with their inner slope the more abrupt. Lower disk very deeply and broadly excavated in the middle; the body-whorl about twice as broad as on the other disk, and slightly more slanting from its rounded periphery. Mouth unarmed, peculiarly small, occupying only about a sixth or seventh of the total breadth, of a narrow lunate figure, not peaked, a little below the level above, slightly beyond it beneath. Outer lip neither dilated, marginated, nor strictured behind. Size, a fifth of an inch, by about a line in height.

Animal dark grey, nearly black, very small in proportion to the shell.

Generally distributed through the British Islands, inhabiting ponds, ditches, and slow streams.

P. NITIDUS, Müller.

Polished smooth, transparent, devoid of septa; body disproportionately large, angulated at the periphery.

Plate CXXVII. fig. 11, 12.

Planorbis nitidus, MÜLLER, Verm. Hist. vol. ii. p. 163, in part.— FLEM. Brit. Animals, p. 278. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 388, 522. — ALDER, Trans. Nat. His. Soc. Northumb. vol. i. p. 30. — GRAY, Manual L. and F. W. Shells, p. 268, pl. 8, f. 93. — THOMPS. Ann. Nat. Hist. vol. vi. p. 125. — BROWN, Ill. Conch. G. B. p. 33, pl. 14, f. 50, 51. — LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 388 (not synonyms).

Helix fontana, LIGHTFOOT, Phil. Trans. 1786, vol. lxxvi. p. 165, pl. 2, upper compartment.—MONT. Test. Brit. vol. ii. p. 462, pl. 6, f. 6.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 193.—RACK.

Dorset Catal. p. 53, pl. 19, f. 19. — Dillw. Recent Shells, vol. ii. p. 898.—Wood, Index Testac. pl. 33, f. 95.

Planorbis complanatus, Drap. Moll. Ter. et Fluv. France, p. 47, pl. 2, f. 20.—Brard, Coq. Envir. Paris, p. 161, pl. 6, f. 4.— C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 83, pl. 4, f. 14. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 2, p. 16, pl. 7, f. 116.—Gras, Moll. Ter. et Fluv. France, p. 59, pl. 4, f. 40.

Helix lenticularis, Alten, Conch. Augsburg, p. 35, pl. 2, f. 4.

Planorbis lenticularis, Kickx, Moll. Brabant. p. 67.—Hartm. in Sturm Deutsch. Fauna, sect. 6, pt. 7, pl. 16; Erd und Süssw. Moll. pl. 13 (Hippeutis).

„ *fontanus*, Turt. Manual L. and F. W. Shells, p. 110, f. 93. — Stein. Schnecken Berlins, pl. 2, f. 22.

Shell most closely resembling *lacustris*, but still more depressed, less polished, usually paler, being horn-coloured, and perfectly devoid of the internal partitions and their corresponding external indications. Whorls of the spire more convex; the apical one more distinct, and less sunken. Keel slightly more central. Mouth nearly filling three-sevenths of the total width, still more compressed than in *lacustris*.

Animal, when adult, brownish black, paler about the tentacula ; when young, pale grey.

Generally distributed through England, and the south of Scotland ; wide spread, but local, in Ireland.

P. lacustris, Lightfoot.

Highly polished, amber-coloured, with internal partitions : periphery angulated.

Plate CXXVIII. figs. 1, 2, 3.

Helix complanatus, Linn. Syst. Nat. ed. 12, p. 1242 (inadequately described).

Planorbis nitidus, Müller, Hist. Verm. vol. ii. p. 163, in part.—Turt. Manual L. and F. W. Shells, p. 116, f. 99. — Drap. Moll. Ter. et Fluv. France, p. 46, pl. 2, f. 17, 18, 19.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 82, pl. 4, f. 12, 13.—Nils. Moll. Suec. Ter. et Fluv. p. 82. — Hartm. Sturm Deutsch. Fauna, sect. 16, pt. 7, pl. 15. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 2, p. 15, pl. 7, f. 114, 115.—Bouillet, Moll. Auvergne, p. 65 (animal).—CANTR. Mem. Ac. Bruxel. vol. xiii. p. 167.—GRAS, Mol. Terr. et Fluv. France, Appx. p. 18.—STEIN, Schnecken Berlins, pl. 2, f. 21.

Helix nitida, GMEL. Syst. Nat. p. 3624 (from Müller).

Nautilus lacustris, LIGHTFOOT, Phil. Trans. vol. lxxvi. (1786,) p. 163, pl. 1.—MONT. Test. Brit. p. 191, pl. 6, f. 3. — TURT. Conch. Diction. p. 117. — FLEMING, Edin. Encycl. vol. vii. pt. 1, p. 86. — DILLW. Recent Shells, vol. i. p. 339. — WOOD, Index Testac. pl. 13, Naut. f. 3.

Segmentina lineata, FLEMING, Brit. Animals, p. 279; Treatise Moll. Anim. (from Encycl. Brit.) pl. 7, f. 18. — GRAY, Manual L. and F. W. Shells. p. 271, pl. 8, f. 99. — BROWN, Ill. Conch. G. B. p. 33, pl. 14, f. 48, 49.

Planorbis lineatus, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 389.—ALDER, Mag. Zool. and Bot. vol. ii. p. 114.

„ *Nautileus*, KICKX, Moll. Brabant. p. 66.

„ *clausulatus*, POTIEZ and MICH. Gal. Douai, Moll. vol. i. p. 209. — WALKER, Test. Minut. Rar. pl. 1, f. 28.

Shell small, much depressed, highly polished, smooth, transparent, of a reddish amber-colour, with a few (usually three on the final coil) distant opaque white radiating curved lines, which indicate the site of the internal septa or partitions; painted here and there, likewise, with a brown line, the vestige of a previous stage of growth. Upper disk convex, except just in the middle, where it is indented, displaying four whorls, the first three of which are very small, merely convex, and of moderately fast increase; lower disk flattened, somewhat broadly, profoundly, and rather abruptly umbilicated. Body-whorl extremely large, filling nearly the entire surface, very much less high than broad, about equally wide above and below, gradually and convexly shelving on the upper disk to a sharply angulated sub-basal keel-like edge. Suture fine. Mouth broader than high, filling about two-fifths of the total width, unarmed, of a blunt arrow-headed shape, being horizontally compressed and trigonally lunate. Outer lip simple, acute, projecting a little below the basal level. Diameter the fifth of an inch.

This shell was confounded by Müller with the last, and has been made the type of a distinct genus by Fleming. It is, however, a true *Planorbis*, and we agree with Mr. Alder in considering the internal partitions of the shell as only of specific import. The animal closely resembles that of *nitidus*.

It is common in ditches and ponds in many parts of England, especially about London, but cannot be regarded as of general distribution. It occurs in the south of Scotland, but has not been noticed in Ireland, except at Cahir, in Tipperary, where Mr. J. D. Humphreys has taken it (Jeffreys).

LIMNÆUS. Draparnaud.

Shell, ovate, oblong, or turreted, thin and horny, dextral; aperture ovate, or expanded, with an entire margin and a more or less twisted columella. No operculum.

Animal with a broad head and snout; tentacles two, triangular, rather short, broad, the eyes placed at their inner basis; mantle even-edged, in some species reflected on the shell; foot broadly lanceolate or sub-ovate. Tongue armed with many transverse rows of numerous stout uncinated teeth, with furcated hooks, flanking a minute simple, hooked, central denticle.

The species of this genus are found in streams, ponds, and lakes, in all parts of the world; and, though numerous, bear, for the most part, a striking resemblance to each other. Some of them are very widely diffused, presenting, like many other fresh-water animals and plants, a great extent of distribution through various climates and distant countries. *Limnæi* have been found in the fossil state in strata dating as far back as the oolitic epoch; and, as in the case of *Physa* and *Planorbis*, the most ancient forms as yet noticed, bear a striking resemblance to common existing types. These mollusks lay their eggs invested in elliptical masses of gelatinous matter, enclosed within a fine membranous envelope: these they attach to stones or water-plants. The number of eggs in a single bundle is often very great.

"The character of the dentition of *Limnæus*," observes Mr. W. Thomson, "appears to be, to have one small central tubercle, as it were squeezed up between two very large lateral ones, each primary lateral having a very large apex internally, with a small external one, quite at the edge; they have altered to one thick prolonged apex projecting inwards, and irregularly lobed on its upper edge. Much the same arrangement prevails in *Amphipeplea*, where, however, the tubercle of the lateral teeth is even still larger in proportion to its plate."

The genus *Amphipeplea* was constituted by Nilson for *Limnæus glutinosus* on account of its large mantle lobes, which the animal reflects over the shell when crawling. We have regarded it as a section of *Limnæus*.*

L. PEREGER, Müller.

Striolate; body abruptly larger; spire short; its whorls not abruptly severed, but convex or rounded; outer lip slanting at its junction with the body-whorl; columellar lip not strongly contorted, nor bent to the left, curved below.

Plate CXXIII. fig. 3 to 7.

LIST. Anim. Angl. pl. 2, f. 23.—SCHRÖT. Flüssc. pl. 6, f. 8.
Buccinum peregrum, MÜLLER, Verm. Hist. vol. ii. p. 130.

---

* The *Limneus detritus*, of Turton's Manual (p. 125) was *described* from a young specimen of the *Bulimus Zebra!* of Müller (Pfeif. Monog. Helic. vol. ii. p. 143; the *undatus* of Bruguiere). The types of the *Helix detritus* of Pulteney and Montagu, both prove to be a white variety of the West Indian *B. exilis* (Pfeif. Monog. Helic. vol. ii. p. 224).

Helix putris, PENN. Brit. Zool. ed. 4, vol. iv. p. 139, pl. 86, f. 137.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 219, pl. 5, f. 8*. — RACK. Dorset Catal. p. 56, pl. 21, f. 13, and pl. 19, f. 30. — TURT. Conch. Diction. p. 67.—DILLW. Recent Shells, vol. ii. p. 965.—WOOD, Index Testac. pl. 35, f. 371.

Turbo trianfractus, DA COSTA, Brit. Conch. pl. 5, f. 13.

Helix peregra, GMEL. Syst. Nat. p. 3659.—MONT. Test. Brit. p. 373, pl. 16, f. 3. —DILLW. Recent Shells, vol. ii. p. 965.

„ *inflata*, GMEL. Syst. Nat. p. 3666, and DILLW. Recent Shells, vol. ii. p. 967, from Schröt. Flüssconch. p. 311, pl. 7, f. 5 (copied WOOD, Index Test. pl. 35, f. 174) probably.

„ *teres*, GMEL. Syst. Nat. p. 3667, from GUALT. pl. 5, f. NN. (copied WOOD, Index Test. pl. 35, f. 181.)

Bulimus peregrus, BRUG. Encycl. Méth. Vers, vol. i. p. 301.

„ *Siculus*, BRUG. Encycl. Méth. Vers, vol. i. p. 335 (from which *Helix Siculus*, DILLW. Recent Shells, vol. ii. p. 970) ?

„ *limosus*, POIRET. Prod. (teste Rossm.)

Helix lutea, MONT. Test. Brit. p. 380, pl. 16, f. 6. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 222.—TURT. Conch. Diction. p. 69.—DILLW. Recent Shells, vol. ii. p. 969.—WOOD, Index Testac. pl. 35, f. 179.

„ *limosa*, (as of Linn.) Mont. Test. Brit. p. 381, pl. 16, f. 1.—BROWN, Mem. Werner. Soc. vol. ii. p. 130, pl. 24, f. 11.

Limneus pereger, DRAP. Moll. Ter. et Fluv. France, p. 50, pl. 2, f. 34, 37. — JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 374. — TURT. Manual L. and F. W. Shells, p. 118, f. 101.—THOMPS. Ann. Nat. Hist. vol. vi. p. 118.—VOITH in Sturm Deutsch. Fauna, sect. 6, pt. 4, pl. 1.

„ *ovatus*, DRAP. Moll. Ter. et Fluv. France, p. 50, pl. 2, f. 30, 31. — PHILIPPI, Mol. Sicil. vol. i. p. 146; vol. ii. p. 120.—CHARPENT. Cat. Moll. Suisse, pl. 2, f. 15.

Lymneus „ BRARD, Coq. Envir. Paris, p. 142, pl. 5, f. 4, 5.

Helix auricula, junior, DILLW. Recent Shells, vol. ii. p. 970.

Limnæus ovatus, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 89, pl. 4, f. 21.

„ *vulgaris*, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 89, pl. 4, f. 22. —KLEEBURG, Moll. Borus. Syn. p. 23.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 97, f. 53.

„ *pereger*, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 90, pl. 4, f. 23, 24. — GRAY, Manual L. and F. W. Shells, p. 233, pl. 7, f. 101, and pl. 11, f. 101, *a*. — MACGIL. Moll. Aberd. p. 106.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 97, f. 54. — PHILIPPI, Moll. Sicil. vol. i. p. 146; vol. ii. p. 120.—STEIN, Schnecken Berlins, pl. 2, f. 11.

Lymnæa peregra, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 412. — BROWN, Illust. Conch. G. B. p. 29, pl. 15, f. 8, 9, 10, 11, 36, 37, 38, 39, 40; pl. 18*, f. 32 to 37. — NILS. Moll. Suec. Ter. et Fluv. p. 66.

Lymnæa ovata, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 412.—Kenyon, Mag. Nat. vol. i. p. 425, f. 182, *g*. —Nils. Moll. Suec. Ter. et Fluv. p. 63.
„ *intermedia*, Lam. (as of Férus.) Anim. s. Vert. (ed. Desh.) vol. viii. p. 414.—Deles. Rec. Coq. Lam. pl. 30, f. 7.
„ *putris*, Fleming, Encyclop. Edin. vol. vii. pt. 1, p. 77.
Limnea lutea, Fleming, Brit. Anim. p. 275.
„ *limosa*, Fleming, Brit. Anim. p. 274.
Lymnea ovata, *vulgaris* and *peregra*, Schub. and Wagn. Chem. Conch. Cab. vol. xii. p. 179, 180, pl. 235, f. 4127 to 4130.
Limneus vulgaris, Kickx, Moll. Brabant. p. 55.
Limnea marginata, Michaud, Comp. Drap. Moll. France, p. 88, pl. 16, f. 15, 16. —Gras, Moll. Ter. et Fluv. France, pl. 4, f. 47.
„ *intermedia*, Michaud, Comp. Drap. Moll. France, p. 86, pl. 16, f. 17, 18. —Gras, Moll. Ter. et Fluv. France, pl. 5, f. 4.
„ *lineata*, Bean, Mag. Nat. Hist. vol. vii. p. 493, f. 62.
Lymnæus ovatus, Kleeburg, Moll. Borus. Syn. p. 23. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 100, pl. 2, f. 56.
Lymnea lacustris, Potiez and Mich. Gal. Douai, Moll. vol. i. p. 219, pl. 22, f. 11, 12.
Limnea ovata, Gras, Moll. Ter. et Fluv. France, pl. 5, f. 3.
„ *peregra*, Gras, Moll. Ter. et Fluv. France, pl. 4, f. 45, 46.

So infinite are the variations of shape in this most abundant species, that we must content ourselves with describing the ordinary characteristic form (pl. CXXIII., f. 4, 6) and then indicating a few of the principal aberrations from it, which occur in our islands.

Shell ovate-acute, oval-acute, or sub-rhombic oval and rounded below, horn-coloured, sometimes with a ferruginous film, more or less thin and glossy, slightly wrinkled lengthways, with the usual spiral interruptions or lines of the genus by no means conspicuous. Spire ranging from scarcely one-sixth to about one-third (with a corresponding increase of area) of the dorsal length, composed of four tapering turns, that are of moderately fast longitudinal increase, swell out convexly from beneath the suture, and are well rounded below; of these the penult is not small-based (as in *auricularius*) in proportion to the breadth of the body, and its area, on the average, is not more than quadruple that of the portion above it; the not peculiarly narrow antepenult is bluntly trigonal and planulately shelving as in *auricularius*, but much broader than high. Body only moderately ventricose, its basal declination more or less rounded, its anterior extremity not peculiarly prominent. Mouth usually filling from four-sevenths to five-sixths of the length, and on the average four-sevenths only of the ventral area, of a broader or narrower peaked ovate figure, well rounded below.

Outer lip not peculiarly projecting, bending downwards at once, only moderately arcuated throughout, for the most part not expanded; its anterior recedence but trifling. Pillar lip much elongated, arched to the right below, in general rather broadly reflected but not appressed, except occasionally above, disclosing a more or less open chink; its left edge not incurved; columellar twist very rarely developed.

Variety ovata. Ventricose, often more transparent and yellow than in the preceding form; spire very small and little elevated, sometimes not filling an eighth of the dorsal length, its whorls of quick increase and peculiarly short; mouth capacious, occupying about two-thirds or even more of the ventral area, and about five-sixths of the total length; pillar lip somewhat flatly reflected over the upper part of the chink (fig. 3).

Variety lineata. Body more or less swollen, large; spire short, its upper turns often eroded, and small in proportion to the penult. Throat with somewhat divergently transverse linear indentations, which cause corresponding external elevations. The spire in sinistral examples (fig. 7) thus sculptured is usually more produced and regular, and the body and aperture are often less ample than in dextral specimens.

In the *lutea* of Montagu the shell is stronger and dull orange yellow; the mouth large; the spire depressed. In the shell figured in the Linnean Transactions (vol. viii. pl. 5, f. 8*), and in the *marginata* of Michaud, the internal rim of the outer lip is thickened.

The usual size of this species is about half an inch in length, but there are varieties an inch long, and others constantly dwarfed.

The animal has a very broad head with large triangular tentacles, the eyes placed on slight auriculations at their inner bases. The foot is broad and round in front, obtuse but somewhat lanceolate behind. The general colour is a yellowish olive, varying in depth, changing to greenish grey at the margin, and deepening to brown or mottled black on the body. This is our commonest *Limnæus*, and is universally diffused through the British islands: it is found in springs high up on mountains, as well as in ponds by the sea-shore nearly brackish.

L. AURICULARIUS, Linnæus.

Almost as broad as long, inflated, wrinkled; spire acute, very short, its whorls not rounded; penult turn very narrow, abruptly larger than the previous coil, truncated conical. Mouth very capacious; columellar fold prominent; outer lip patulous, projecting above almost at right angles to the axis.

Plate CXXIII. fig. 1 and (var. acutus) 2.

SCHRÖTER, Flüssconch. pl. 6, f. 4, 5; pl. 7, f. 12.

Helix auricularia, LINN. Syst. Nat. ed. 12, p. 1249.—PENN. Brit. Zool. ed. 4, vol. iv. p. 139, pl. 86, f. 138.—PULTENEY, Hutchins, Hist. Dorset, p. 49.—DONOV. Brit. Shells, vol. ii. pl. 51, f. 1.—MONT. Test. Brit. p. 375, pl. 16, f. 2.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 221 (not var.).— Dorset

Catalog. p. 56, pl. 21, f. 17.—Turt. Conch. Diction. p. 68. —Chemn. Conch. Cab. vol. ix. pt. 2, p. 171, pl. 135, f. 1241, 1242.—Wood, Index Testaceolog. pl. 35, f. 186. —Dillw. Recent Shells, vol. ii. p. 969 (not var.).

Buccinum auricula, Müller, Hist. Verm. pt. 2, p. 126. —Wolf in Sturm, Deutsch. Fauna, sect. vi. pt. 1.

Turbo patulus, Da Costa, Brit. Conch. p. 95, pl. 5, f. 17.

Bulimus auricularius, Brug. Encycl. Méth. Vers, vol. i. p. 304.

Limneus ,, Drap. Moll. Ter. et Fluv. France, p. 49, pl. 2, f. 28, 29, 32. —Jeffreys, Trans. Linn. Soc. vol. xvi. p. 372.—Turt. Manual L. and F.W. Shells, p. 117, f. 100.—Thompson, Ann. Nat. Hist. vol. vi. p. 117.—Kickx, Moll. Brabant. Austral. p. 56.

Lymneus ,, Brard, Coq. Paris, p. 140, pl. 5, f. 23.

Lymnæa auricularia, Lamarck, Anim. s. Vert. (ed. Desh.) vol. viii. p. 411.—Brown, Illust. Conch. G. B. p. 29, pl. 15, f. 29 to 32.—Nils. Moll. Suec. Ter. et Fluv. p. 61. —Sowerby, Conch. Manual, f. 309.

Limnæus auricularius, C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 85, pl. 4, f. 17, 18.—Gray, Manual L. and F.W. Shells, p. 232, pl. 7, f. 100.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 98, pl. 2, f. 55.—Stein, Schnecken Berlins, pl. 2, f. 12.

Limneus acutus, Jeffr. Trans. Linn. Soc. vol. xvi. p. 373.

Limnea auricularia, Fleming, Brit. Animals, p. 275.

Limnæus pereger, var. acutus, Gray, Manual L. and F. W. Shells, pl. 11, f. 101 d.

Limnæa ,, Gras, Moll. Ter. et Fluv. France, pl. 5, f. 1, 2.

Gulnaria auricula, Hartm. Erd und Süssw. Gaster. pl. 16.

It is the combination of characters, most of which are separately present in the preceding species, that constitutes the specific individuality of *L. auricularius*. For one of the many forms of *pereger* displays the capacious aperture, another that peculiarly rapid volutional increase which effects the disproportion between the penult and antepenult turns, a third the projecting anterior extremity, a fourth the curious twisted gibbous look of its body when examined at its left side, yet collectively these characters give such an aspect to the species that even when the fold is imperfectly developed, no practical difficulty occurs in the determination of specimens.

Shell variable in form, more or less broad, rhomboidal-ovate when the spire composes a full fifth of the dorsal length, obovate subtrigonal when it is so short as barely to fill a sixth of that space; shining, horn-coloured both within and without, manifestly and comparatively coarsely wrinkled lengthways, with the spiral lines or interruptions also distinct. Whorls four to four and a half, somewhat planulately shelving towards the obliquely curved suture; spire extremely short, and small; its turns of very rapid longitudinal increase; the minute apical coil and the moderately high and much tapering antepenult volution together not equal in area to a fifth of the penult turn; the latter small-based in proportion to the body, which projects above on its right, and has its basal declination more or less gradual and not much rounded. Mouth occupying from three-fourths to four-fifths of the ventral length, and from four-sevenths to almost two-thirds of the area, of a somewhat rounded oval figure; outer lip extremely prominent, jutting out above almost at right angles to the axis previous to the sweep of its uninterrupted arcuation, advancing towards the middle, receding anteriorly, expanded throughout, especially below, which gives a projecting look to the anterior dorsal extremity. Pillar lip elongated, bending to the left, much reflected, not appressed, but disclosing a more or less open umbilical chink; its left edge much incurved; columellar twist more or less strongly marked. Length an inch (or even more), breadth about a fourth less.

In the immature variety (*acutus*) the mouth is much less capacious, and the body is very much smaller and narrower in relation to the spire: the high and narrow turns of the latter, and the anterior projection of the body are still preserved.

The animal, except in those features which correspond with the differences of the shell, closely resembles that of *pereger*.

The more limited and peculiar range of this form would seem to warrant our regarding it as distinct. It is chiefly found in the midland and south eastern counties, and is abundant in many localities around London, Clumber Lake, Notts, and in company with the var. *acutus* (which occurs in marshes on the sea coast) at Crymlyn Barrows, near Swansea (Jeffreys.) Sparingly at Worcester (Reece). Common about Nottingham (Lowe); fine and characteristic at York (T. Hincks); scarce and poor near Clitheroe (Winstanley); at Prestwich car, small, and ponds near Darlington (Alder); pond, Abercorn park, south of Scotland (Logan). Not uncommon in Ireland (W. Thompson).

L. BURNETTI, Alder.

Ampullaceous, wrinkled; mouth very ample; fold indistinct. Spire sunken or almost level.

Plate CXXIII. fig. 8, 9.

Limnæa Burnetti, ALDER, Ann. Nat. Hist. new ser. vol. ii. p. 396, pl. 11, top figures.

Shell obliquely ovate-globose, very thin, pale reddish tawny, semi-transparent, a little glossed, more or less regularly wrinkled lengthways, the spiral lines or interruptions distant or inconspicuous. Spire scarcely, if at all, elevated; the penult volution rounded, the rest very small and sunken. Almost the entire area occupied by the body, which abruptly swells out from the well pronounced and little slanting suture, and is broadly tumid in the middle; anterior or basal declination rounded and abrupt on the ventral side; more gradual and less convex dorsally. Mouth peculiarly and obliquely prominent, so as to project chiefly below, subpyriform-ovate, carved and acutely peaked above, well rounded below, all but occupying the entire length, yet only filling four-sevenths at most of the ventral area, since the body swelling into the aperture does not so quickly attenuate posteriorly as in most of our *Limnæi*. Outer lip acute, regularly arcuated, not sinuated at the edge, receding below. Pillar lip very thin, white, slanting to the right, not at all appressed, but disclosing the umbilical chink. No decided columellar twist. Length seven lines and a half; breadth half an inch.

The animal is of the usual form in this genus, but is a little broader than that of *pereger*. It is of a dark olive colour spotted with opake yellow. The cloak is nearly black with a few paler spots.

It was first detected by Mr. Burnett of Newcastle in the stomach of trout caught in Loch Shene, Dumfriesshire, where it was afterwards taken alive by the same gentleman (Alder). Mr. Jeffreys (who regards it as a variety of *pereger*) informs us that it has been taken by Mr. M. Moggridge in Llyn y van fach, Breconshire.

With some hesitation we annex as a variety to this species the *Limnæus pereger*, var. 4. (*lacustris*) of Gray's Manual (p. 234, pl. 11, fig. 101 b.—*Amphipeplea lacustris*, Brown, Il. Conch. G. B. p. 30, pl. 15, f. 24, 25?) figured by us in plate CXXXII. fig. 10. The apex is eroded, not quite sunken, and yet barely elevated above the body whorl; the pillar is more appressed. It is not improbable that both this and the typical *Burnetti* may prove in the end to be abnormal forms of *pereger*. We have taken the so-called *lacustris* in Loch Leven and some other lowland Scottish lakes.

L. stagnalis, Linnæus.

Conic-ovate, imperforate, body whorl abruptly larger, usually subangulated above; spire turreted, acute. Aperture constituting more than half of the total length: columellar fold strong; edge of outer lip usually spreading.

Plate CXXIV. fig. 4, 5.

Helix stagnalis, Linn. Syst. Nat. ed. 12, p. 1249.— Penn. Brit. Zool. ed. 4, vol. iv. p. 138, pl. 86, f. 136, a.—Pulteney, Hutchins, Hist. Dorset, p. 48.— Donov. Brit. Shells, vol. ii. pl. 51, f. 2.—Mont. Test. Brit. p. 367, pl. 16, f. 8.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 214.—Rack. Dorset Catalog. p. 55, pl. 21, f. 11.—Turt. Conch. Diction. p. 65, f. 69.—Schröt. Flüssconch, pl. 7, fig. 1, 2.— Burrows, Elem. Conch. pl. 20, f. 5.—Dillw. Recent Shells, vol. ii. p. 962.—Wood, Index Testac. pl. 35, f. 166.

,, *fragilis*,* Linn. Syst. Nat. ed. 12, p. 1249, probably.—Mont. Test. Brit. p. 369, pl. 16, f. 7.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 215, probably.—Turt. Conch. Diction. p. 65.—Schröt. Flüssconch. pl. 7, f. 8. — Dillw. Recent Shells, vol. ii. p. 963.—Wood, Index Testac. pl. 35, f. 167.

Buccinum stagnale, Müller, Verm. Ter. et Fluv. pt. 2, p. 133.—Wolf, in Sturm Deutsch. Fauna, sect. 6, pt. 1.

Turbo stagnalis, Da Costa, Brit. Conch. p. 93, pl. 5, f. 11.

Bulimus ,, Brug. Encyc. Méth. Vers, vol. i. p. 303.

Buccinum roseo-labiatum, Wolf, in Sturm, Deutsch. Fauna, sect. 6, pt. 1.

Limneus stagnalis, Drap. Moll. Ter. et Fluv. France, p. 51, pl. 2, f. 38, 39.—Turt. Manual L. and F. W. Shells, p. 121, f. 104.—Hartm. Sturm Deutsch. Fauna, sect. 6, pt. 8, pl. 11, 12.—Kickx, Moll. Brabant, p. 58.— Charpent. Cat. Moll. Suisse, pl. 2, f. 13, 14.

Lymneus ,, Brard, Coq. Paris, p. 133, pl. 5, f. 1.

Limnæus ,, C. Pfeif. Deutsch. L. und S. Moll. pt. 1, p. 86, pl. 4, f. 18, 19; pl. 1, f. 11, animal.—Gray, Manual L. and F. W. Shells, p. 236, pl. 7, f. 104.—Rossmässl. Iconog. Land und Süssw.

---

* This is not the *Bulimus fragilis* of Lamarck (Deles. Rec. Coq. pl. 28, f. 2) which was erroneously published by that writer (on the authority of Dr. Leach) as the *Helix fragilis* of Montagu, and a native of England.

Moll. pt. 1, p. 95, pl. 2, f. 49, and pl. 5, f. 83, 84, 85.—Cantr. Mem. Ac. Brux. vol. xiii. p. 159.—Philippi, Moll. Sicil. vol. ii. p. 120.—Stein, Schnecken Berlins, pl. 2, f. 13.

Lymnæa stagnalis, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 408.—Brown. Illust. Conch. G. B. p. 28, pl. 15, f. 19 to 23.—Nils. Moll. Suec. Ter. et Fluv. p. 60.—Sowerby, Conch. Manual, f. 308.

Limnea „ Sowerby, Genera Shells, Lim. f. 1.—Fleming, Brit. Anim. p. 273.—Bouillet, Moll. Auvergne, p. 69, animal.—Gras, Moll. Ter. et Fluv. France, p. 63.—Reeve, Conch. Syst. vol. ii. pl. 191, f. 1.—Mermet, Moll. Pyrén. p. 66.

Limneus major, Jeffreys, Trans. Lin. Soc. vol. xvi. p. 375.

Limnea fragilis, Fleming, Brit. Anim. p. 273.

Limneus „ Turt. Manual L. and F. W. Shells, p. 121, f. 105.

Stagnicola vulgaris, Hartm. Erd und Süssw. Gaster. pl. 8, 12.

Shell ovate acuminated, or turreted oblong-oval, the body being abruptly larger and inflated, the spire produced and of a sudden narrowly conical; horn-coloured (sometimes pallid, sometimes ochraceous), wrinkled lengthways (at times, though rarely, somewhat plicately so), the surface beneath a powerful glass appearing exquisitely chased by dense spiral series of short and often scarcely interrupted longitudinal scratches. Whorls fully seven, elongated, tapering to a fine point, of rapid longitudinal increase, peculiarly attenuated and flat-surfaced above, convex or rounded below, at times appearing subangulated (especially the body) from this contrast; suture simple, slanting, profound, the area beneath it sometimes edged with white; the apical coils rounded. Body long, its rounded swell a little depressed in the middle; basal declination convex, more or less gradual. Mouth capacious, rounded below, variable in shape, in the more typical examples of a peaked and unsymmetrical ovate or oval figure, occupying about one half (usually rather more) of the ventral length. Outer lip prominent, a little disposed to expand, its arch for the most part more or less depressed in the middle; its edge peculiarly sinuous, alternately receding and advancing, the latter chiefly below the middle. Inner lip bending to the left; pillar lip reflected and raised so as to form an obliquely arcuated prominent fold. Labial enamel appressed even to its extremity so as not to form any umbilicus. Our foreign examples measure two inches at the least in length, and fully an inch across; British examples rarely attain to such dimensions.

Var. *fragilis* smaller, the body less swollen, more regularly convex and usually more elongated, not at all angulated; the volution not planulate posteriorly. Aperture partaking of the general slenderness; the marginal sinuation of the outer lip much less marked.

The animal is of a yellowish olive hue, more or less marked with pale opake specks.

This fine species is abundant in still water localities, slow running rivers and canals throughout the greater part of England, exclusive of the extreme south-west, and some of the more mountainous districts. It has been introduced into a few localities in the south of Scotland. In Ireland it is local, but generally diffused (W. Thompson). It is not found in the Isle of Man.*

---

* Turton's figure of his *Limneus scaturiginum* (Manual, f. 102) was copied from the *Physa ! scaturiginum* of Draparnaud (Hist. Moll. pl. 3, f. 14), supposed to be the young of *Achatina folliculus.* The specimen, "not half a line long," mistaken for this species, was the fry of a *Limnæus*, and, according to Mr. Jeffreys, of *L. stagnalis.*

L. TRUNCATULUS, Müller.

Small, perforated, conic-oval, spire about as long as the aperture; whorls tumid, deeply and abruptly divided.

Plate CXXIV. fig. 3.

Buccinum truncatulum, MÜLLER, Verm. Ter. et Fluv. vol. ii. p. 130.
Helix truncatula, GMELIN, Syst. Nat. p. 3659. — DILLW. Recent Shells, vol. ii. p. 967.
Bulimus truncatus, BRUG. Encycl. Méth. Vers, vol. i. p. 310.
Helix fossaria, MONT. Test. Brit. p. 372, pl. 16, f. 9. — MATON and RACK. Trans. Linn. vol. viii. p. 217, pl. 5, f. 9. — RACK. Dorset Catalog. p. 56, pl. 18, f. 17.—TURT. Conch. Diction. p. 66.—DILLW. Recent Shells, vol. ii. p. 965. — WOOD, Index Test. pl. 35, f. 169.
Lymneus minutus, DRAP. Moll. Ter. et Fluv. France, p. 53, pl. 3, f. 5, 6. — ALDER, Mag. Zool. and Bot. vol. ii. p. 113.
Lymnæa minuta, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 415. — BROWN, Illust. Conch. G. B. p. 28, pl. 15, f. 12, 13, and pl. 18*, f. 30, 31.—NILS. Moll. Suec. Ter. et Fluv. p. 72.
Limnæus minutus, C. PFEIF. Deutsch. Land und Süssw. Moll. pt. 1, p. 93, pl. 4, f. 27.—ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 100, pl. 2, f. 57. — PHILIPPI, Moll. Sicil. vol. i. p. 147; vol. ii. p. 121.
Limneus truncatulus, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 377.—THOMPSON, Ann. Nat. Hist. vol. vi. p. 120.
Limnea fossaria, FLEMING, Brit. Anim. p. 274.
Limneus fossarius, TURT. Manual L. and F. W. Shells, p. 124, f. 108.
Lymnea minuta, SCHUB. and WAGN. in Conch. Cab. vol. xii. p. 182, pl. 235, f. 4134, 4135.
Limnæus limosus, CANTR. Mem. Ac. Brux. 1836, p. 157.
„ *truncatulus*, GRAY, Manual L. and F. W. Shells, p. 240, pl. 7, f. 108. —MACGIL. Moll. Aberd. p. 110. — STEIN, Schnecken Berlins, pl. 2, f. 10.
Limnea minuta, GRAS, Moll. Ter. et Fluv. France, pl. 4, f. 44.
Limnæa truncatula, ALDER, Moll. Northumb. and Durh. p. 42.

Shell small, oblong-conic, occasionally more produced, thin, glossy, pale horn-coloured, nearly smooth, with the ordinary microscopical chasing. Whorls six, peculiarly rotundately inflated, swelling abruptly out above from the simple and little slanting suture, of quick longitudinal increase, scarcely tapering above; penult turn not particularly short, generally filling more than a quarter of the total length; apex small. Body, if anything, rather longer than the spire, ventricosely rounded; its basal declination moderately quick. Mouth occupying one half the length, suboval, rather abruptly angular above, occasionally tinged with chestnut brown. Outer lip a little projecting, regularly arcuated; its edge not sinuated. Pillar lip straightish, flatly and broadly reflected as a white plate, which is not appressed, but exhibits a decided perforation behind it; fold not marked. Extreme length half an inch, with a breadth of three lines.

The animal, which differs from its allies in no remarkable particulars of form, varies in colour from pale brownish grey to nearly black.

This species often coats its shell with mud, and is much in the habit of living on the margins of streams and ditches, out of the water. It is universally diffused, living in all sorts of watery places, and occurring at considerable elevations among mountains.

L. GLABER, Müller.

Elongated, cylindraceous, turreted, whorls rounded; aperture very small.

Plate CXXIV. fig. 1.

Buccinum glabrum, MÜLLER, Verm. Ter. et Fluv. vol. ii. p. 135 (probably).
Helix octona,* PENN. (not Linn.) Brit. Zool. ed. 4, vol. iv. p. 138, pl. 86, f. 135.

---

* Dr. Pulteney having forwarded a supposed Dorset shell thus named (Pult. in Hutchins, Hist. Dorset, App. p. 49) to Montagu, the latter identified it as a common West Indian species, the *Achatina octona* of authors (Pfeif. Monog. Helic. vol. ii. p. 266). The drawing of *H. octona* in the Linnean Transactions (vol. viii. pl. 5, f. 10)—the accompanying description (p. 211) is transcribed from that of Linnæus—represents a broken lipped specimen of this *Achatina*.

Bulimus leucostoma, Poiret, Prodr. p. 37 (teste Michaud).
Helix octanfracta, Mont. Test. Brit. p. 396, 588, pl. 11, f. 8. — Maton and Rack. Trans. Linn. vol. viii. p. 211. — Rack. Dorset Catalog. p. 55, pl. 18, f. 11.—Turt. Conch. Diction. p. 64. —Wood, Index Testac. pl. 35, f. 149.
„ *peregrina*, Dillw. Recent Shells, vol. ii. p. 954.
Limneus elongatus, Drap. Moll. Ter. et Fluv. France, p. 52, pl. 3, f. 3, 4. — Jeffr. Trans. Linn. Soc. vol. xvi. p. 376, 520. — Turt. Conch. Man. p. 122, f. 106.
Lymnæa leucostoma, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 414.
Limnæus elongatus, Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 92, pl. 4, f. 26.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 101, pl. 2, f. 58.
Limnea octona, Flem. Brit. Anim. p. 274.
„ *elongata*, Sowerby, Genera Shells, Lim. f. 6. — Reeve, Conch. Syst. pl. 191, f. 6.—Mermet, Moll. Pyrén. p. 68.
Limnæus glaber, Gray, Turt. Man. L. and F. W. Shells, p. 242, pl. 9, f. 106.— Stein, Schnecken Berlins, pl. 2, f. 9.
Limnea leucostoma, Gras, Moll. Ter. et Fluv. France, p. 65, pl. 5, f. 5.
Lymnæa elongata, Nils. Moll. Suec. Ter. et Fluv. p. 71. — Brown, Illust. Conch. G. B. p. 29, pl. 15, f. 1, 2, 3, 5. — Schub. and Wagn. Conch. Cab. vol. xii. p. 181, pl. 235, f. 4132, 4133.

Shell turreted-subcylindraceous, the slender body being nearly equally broad throughout, and the spire slowly tapering to a fine point ; thin, somewhat glossy, pale horn-coloured, slightly wrinkled lengthways, the ordinary microscopic chasing less distinct than in most of the genus. Whorls more frequently seven, occasionally nine, rather high, of slow increase, simply convex, or moderately rounded in the middle, slightly attenuated, but not at all planulate above, swelling out at once from the very profound and but moderately slanting suture. Body not quite occupying half of the dorsal length, its surface rounded but not inflated ; basal declination not abrupt. Mouth small, oblong-acute, filling rather more than a third of the ventral length, rounded and much receding

The figure (72) in Turton's Manual, is so bad that Pfeiffer has cited it with doubt for *A. semitarum*, but from the description (Conch. Diction. p. 63; Man. L. and F. Shells, p. 90) we know it to be intended for *octona*.

below, usually white. Outer lip subarcuated, not prominent, not disposed to expand except at the anterior extremity, often thickened by a callus at a little distance from its edge, which latter is not sinuated. Pillar lip narrowly reflected, more or less curved; labial enamel usually appressed in the adult, but often exposing an umbilical chink in the young. An individual that measured five-eighths of an inch in length, was a quarter of an inch broad: specimens are recorded as measuring an inch in length, with a proportionate width.

The animal is very dusky, and shorter-footed in proportion to its shell than the neighbouring species.

It is one of our scarcer fresh water shells. It occurs in still waters. It occurs in several of our southern counties, especially Wilts and Somerset. Penzance (N. T. Miller); Staffordshire; in marshes on the sea-coast near Swansea; Cardiff; Manorbeer (Jeffreys); York, in small ditches, but rare (T. Hincks); Clitheroe (Reece). Not uncommon near Newcastle (Alder). Rare in Ireland; Belfast (W. Thompson); Cork (Humphreys).

L. PALUSTRIS, Linnæus.

Ovate-oblong, usually purplish-brown; spire conic, about as long as the mouth; whorl simply rounded not abruptly divided; body whorl, not suddenly larger, throat usually coloured; outer lip not spreading.

Plate CXXIV. fig. 2.

Buccinum palustre, MÜLLER, Verm. Ter. et Fluv. vol. ii. p. 131.—SCHRÖT. Flüssconch. pl. 7, f. 9, 10.

Helix stagnalis, var. β. PENN. Brit. Zool. ed. 4, vol. iv. p. 139, pl. 86, f. 136, B (teste Mont.).

„ *palustris*, GMEL. Syst. Nat. p. 3658.—PULT. Hutchins, Hist. Dorset, p. 48.—MONT. Test. Brit. p. 370, pl. 16, f. 10; Suppl. p. 138.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 216, pl. 5, f. 8.—RACK. Dorset Catalog. p. 55, pl. 18, f. 18 (not well).—

Turt. Conch. Diction. p. 66.—Dillw. Recent Shells, vol. ii. p. 963.—Wood, Index Testac. pl. 35. f. 168.

Helix corvus, Gmel. Syst. Nat. p. 3665 (from Schröt. Flüssconch. p. 307, pl. 7, f. 3, 4).

„ *fragilis*, Pult. Hutchins, Hist. Dorset, p. 48.—Donov. Brit. Shells, vol. v. pl. 175, f. 1.

„ *fontinalis*, Donov. Brit. Shells, vol. v. pl. 175, f. 2 and *.

Limneus palustris, Draparn. Moll. Ter. et Fluv. France, p. 52, pl. 2, f. 40, 41, 42, and pl. 3, f. 1, 2.—Turt. Manual L. and F. W. Shells, p. 123, f. 107.—Alder, Mag. Zool. and Bot. vol. ii. p. 114. —Thomps. Ann. Nat. Hist. vol. vi. p. 119.—Kickx, Moll. Brabant. p. 59.

Lymneus „ Brard, Coq. Paris, p. 136, pl. 5, f. 6, 7.

Limnæus „ C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 88, pl. 4, f. 20.—Macgilliv. Moll. Aberd. p. 109.—Gray, Manual L. and F. W. Shells, p. 239, pl. 7, f. 107.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 96, f. 51, 52.—Philippi, Moll. Sicil. vol. i. p. 146; vol. ii. p. 120.

Lymnæa „ Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 409.—Brown, Illust. Conch. G. B. p. 28, pl. 15, 18, 4, 14, 26.

„ *fusca*, Nils. Moll. Suec. Ter. et Fluv. p. 70.

Limneus communis, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 376.

„ *tinctus*, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 378, 392.

Limnea palustris, Fleming, Brit. Animals, p. 274.—Bouillet, Moll. Auvergne, p. 70, animal.—Gras, Moll. Ter. et Fluv. France, p. 64, pl. 5, f. 6.—Mermet, Moll. Pyrén. p. 67.

Lymnea fragilis, Kenyon, Mag. Nat. Hist. (1829) vol. i. p. 425, f. 182, *c*.

Limnæus „ Stein, Schnecken Berlins, pl. 2, f. 14.

Shell oblong-conic, or elongated oblong-conic, the body being of a rather narrow truncated oval figure, and the spire, when not decollated, tapering gradually to a small point; moderately strong for the genus, not particularly transparent, not lustrous, brownish horn-coloured, with the microscopic sculpture as in *stagnalis*, and with the meandering vein-like transverse elevations that are occasionally present in the last, more often conspicuous and frequent. Whorls seven, of moderately fast longitudinal increase, more or less rounded, never angulated, moderately tapering, and neither planulate nor abruptly tumid above, divided by a profound and slanting suture: penult turn filling about a fourth of the dorsal length. Body as long as, or slightly longer than the spire, merely subventricose; its convexity not flattened in the middle; its basal declination rounded but not abrupt. Mouth usually stained with liver colour or chocolate, neither capacious, nor very prominent, of a peaked suboval figure, occupying one half, or very nearly so, of the ventral length. Outer lip regularly arched; its edge scarcely at all sinuated. Pillar lip raised at the edge, reflected, not so curved as in *stagnalis*, sometimes white, sometimes liver coloured: labial enamel spread, not usually quite appressed, but exposing at times a slight chink. Our largest specimen measures fifteen lines in length, and six and a half in breadth.

The *reflexa*, *umbrosa*, and *elodes* of Say, American Conchology, pl. 31, which form apparently but one species, are scarcely distinguishable from this variable shell.

The animal is dusky, nearly black, tinged with greenish and olive.

Generally diffused through the three kingdoms, inhabiting ditches, ponds, and springs. It scarcely ranges so far north with us as *pereger* and *truncatulus* do.

L. GLUTINOSUS, Müller.

Subglobose, extremely thin and transparent, polished, pale amber-coloured: spire extremely small but not truncated: mouth very large.

Plate CXXIV. figs. 6, 7.

Buccinum glutinosum, Müller, Verm. Ter. et Fluv. vol. ii. p. 129.

Helix glutinosa, Mont. Test. Brit. p. 379, pl. 16, f. 5; Suppl. p. 139.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 222.—Turt. Conch. Diction. p. 69.—Dillw. Recent Shells, vol. ii. p. 970.—Wood, Index Testaceol. pl. 35, f. 182.

Limneus glutinosus, Draparn. Moll. Ter. et Fluv. France, p. 50.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 371, 519.—Turt. Manual L. and F.W. Shells, p. 120, f. 103.—Alder, Mag. Z. and B. vol. ii. p. 115.—Kickx, Moll. Brabant. p. 55, pl. 1,

f. 11, 12.—Michaud, Suppl. Drap. Moll. France, pl. 16, f. 13, 14.—Mém. Acad. Brux. vol. xi.—Gras, Moll. Ter. et Fluv. France, p. 18.

Amphipeplea glutinosa, Nils. Moll. Suec. Ter. et Fluv. p. 58.—Gray, Manual L. and F. W. Shells, p. 243, pl. 9, f. 103.—Brown, Illust. Conch. G. B. p. 30, pl. 15, f. 27, 28.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 1, p. 93, f. 48.—Stein, Schnecken Berlins, pl. 2, f. 8.

Limnea „ Sowerby, Genera, Shells, Lim. f. 5.—Fleming, Brit. Animals, p. 275.—Desm. Bull. Linn. Bord. vol. vii. p. 142, pl. 1, a.—Reeve, Conch. Syst. vol. ii. p. 191, f. 5.—Mermet, Moll. Pyren. p. 65.

Lymnea „ Desh. Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 419.

Shell suborbicular, or globosely oval, so thin as to be almost membranaceous, quite transparent, highly polished, of an uniform very pale amber, or yellowish horn-colour, finely wrinkled lengthways. Body composing nearly the entire shell, much inflated, swelling out convexly from the somewhat sunken suture; basal declination rounded, and rather quick. Spire scarcely elevated, extremely small, formed of three moderately rounded, though depressed and tapering volutions, whose increase is moderately fast; base of the penult whorl very small; apical turn minute and very blunt. Mouth capacious, extending almost the whole length, and filling from four-sevenths to two-thirds of the ventral surface, ovate acute, being well rounded below, and rather suddenly contracted above by the swell of the body. Outer lip neither expanded, nor much receding below, not sinuated at the margin, simply arched throughout, and forming along with the regularly arcuated left edge of the broad but thinly spread enamel of the inner lip, a rounded ovate figure; pillar lip narrow, arching to the right anteriorly; columellar twist only faint: no umbilical crevice. Length rather more than half an inch; breadth, three-eighths of an inch.

The animal is remarkable for its large mantle lobes, of a yellowish hue, speckled with opake sulphury dots, and very slimy to the touch; with them, when in the water, it covers its shell, but instantly withdraws them on being touched. The tentacles and foot are similar to those of other *Lymnæi.* Van Beneden has investigated its anatomy, and shown that there are some remarkable peculiarities in its nervous system, having relation to its dilated mantle.

It is a scarce shell, though plentiful where it occurs. It is found in the south-eastern English counties, but very locally: it occurs in Windermere lake, but in one part only, according to Mr. Winstanly. Mr. Gibbs, of the Geological Survey, has communicated to us fine specimens from Bala Lake, in North Wales.

L. INVOLUTUS, Harvey.

Almost membranaceous, transparent; ovate, with the spire truncated or sunken.

Plate CXXII. fig. 11.

Limneus involutus, HARVEY, MS. Trans. Linn. Soc. vol. xvii. p. 559 (no desc.).—ALDER, Mag. Z. and B. vol. ii. p. 115 (no desc.).—THOMPSON and GOODSIR, Ann. N. H. vol. v. p. 22.

Amphipeplea involuta, GRAY, Manual L. and F. W. Shells, p. 245, pl. 12, f. 147.

Lymnæa ,, BROWN, Illust. Conch. G. B. p. 29, pl. 18, f. 5.

Shell rather small, subtruncated-ovate, extremely thin, more or less glossy, transparent, fulvous horn-coloured. Body composing nearly the entire shell, the spire, which consists of scarcely three coils, that are remarkably small and merely convex, being flat or a little sunken; surface of the last volution not equably ventricose, but rather more planulate above; basal declination gradual, convex. Mouth of a curved pear-shape, occupying about three-fifths of the ventral area; very broadly rounded, and a little reflected, below; gradually and acutely contracted above by the moderate swell of the body, and the slanting inclination of the outer lip, which latter is arcuated (especially anteriorly); enamel of the inner lip diffused but very thin; pillar extremely narrow, arched, the fold not very conspicuous. No umbilical chink. Length five lines and a half; breadth three lines and a half.

The external characters of this animal, as displayed when living, have not been fully described; some account of its anatomy has, however, been published by Professor Goodsir. This remarkable shell, which after all may be some monstrous yet permanent variation of a more ordinary *Limnæus*, was discovered by Professor Harvey, in a small Alpine lake on Cromaglaun Mountain, near Killarney, where it was afterwards taken by our lamented friend, Mr. W. Thompson, of Belfast, and by Dr. Robert Ball.*

ANCYLUS. Geoffroy.

Shell limpet-shaped, thin, horny, ovate or oblong, depresso-conical, with a posterior, slightly and obliquely recurved apex. Aperture ample, with entire margin; inner surface exhibiting a laterally-interrupted semilunar scar. No operculum.

Animal with a broad head and two triangular tentacles with the eyes at their bases. Mantle simple, not reflected. Foot ovate, ample. Tongue armed with rows of numerous hamate teeth, much incurved, flanking narrow, compressed central denticle.

The striking resemblance of the shells of these *fresh-*

---

* The *Turbo rivulus* of authors (Mont. Test. Brit. p. 331; Maton and Rack. Trans. Linn. vol. viii. p. 186; Turt. Conch. Diction. p. 229), was solely constituted from an execrable figure in Walker's Testacea (f. 57), apparently intended for a member of this genus.

water limpets, as they are popularly designated, to marine *Patellæ*, for a long time misled naturalists as to the true nature and position of the animal of *Ancylus*. This discussion has, however, been set completely at rest; the affinities of the genus are now understood, and its place is universally recognized as being in immediate proximity with *Limnæus*, *Physa*, and *Planorbis*. Our two indigenous fresh-water limpets differ from each other in some remarkable particulars, and are regarded by many naturalists as types of distinct genera, under the names of *Ancylus* and *Velletia*. Until we shall know more of the animals of exotic forms, we are disinclined to accept so great a distinction, believing, however, that it may hold good eventually. In favour of such a view we may quote the observations on the differences in their dentition, as described by Mr. W. Thomson:—"In *Ancylus* there are thirty similar lateral teeth in a straight line on each side of the central tooth, and then there is a slight curve through a series of six more teeth, where a trifling change in their form occurs. In *Velletia*, on the contrary, no part of the horizontal row is straight; its central part is much arched, and is composed of the central tooth and twelve lateral teeth on each side, which do not alter much in form. Then comes one tooth of a different form, and lastly six more on each side, which latter are in a slight curve."

A. FLUVIATILIS, Müller.

Conoid: aperture roundish oval; apex directed to the right.

Plate CXXII. fig. 4.

Patella lacustris, LINN. Syst. Nat. ed. 12, p. 1260. — PENN. Brit. Zool. ed. 4, vol. iv. p. 143.—PULTENEY, Hutchins, Hist. Dorset, p. 51.—DONOV. Brit. Shells, vol. v. pl. 147. — MATON and RACK. Trans. Linn. Soc. vol. viii. p. 232. — RACK. Dorset Catalog.

p. 58, pl. 22, f. 8.—Turt. Conch. Diction. p. 138.—Dillw. Recent Shells, vol. ii. p. 1041.—Wood, Index Testac. pl. 37, f. 56.

Ancylus fluviatilis, Müller, Verm. Hist. pt. 2, p. 201. — Fleming, Brit. Anim. p. 280. — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 390.— Turt. Manual L. and F. W. Shells, p. 140, f. 125; ed. Gray, p. 249, f. 125. — Thomps. Ann. Nat. Hist. vol. vi. p. 121.—Macgilliv. Moll. Aberd. p. 121.—Brown, Illust. Conch. G. B. p. 59, pl. 12, f. 1, 4, 6.—Drap. Moll. Ter. et Fluv. France, p. 48, pl. 2, f. 23, 24. — Voith in Sturm Deutsch. Fauna, sect. 6, pt. 4, pl. 9. — C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 107, pl. 4, f. 44, 45, and pl. 1, f. 16, animal.—Nils. Moll. Suec. Ter. et Fluv. p. 84. —Schub. and Wagn. Conch. Cab. vol. xii. p. 162, pl. 235, f. 4107.—Kickx, Moll. Brabant. p. 77.—Sowerby, Genera Shells, Anc. f. 1. — Philippi, Moll. Sicil. vol. i. p. 120; vol. ii. p. 93. — Gras, Moll. Ter. et Fluv. France, p. 65, pl. 5, f. 10. — Reeve, Conch. Syst. vol. ii. pl. 193, f. 1. — Mermet, Moll. Pyrén. p. 71.— Dupuy, Moll. Gers, p. 61. —Stein, Schnecken Berlins, pl. 3, f. 7.

Patella ,, Da Costa, Brit. Conch. p. 1, pl. 2, f. 8. — Mont. Test. Brit. p. 482.

Ancilus ,, Brard, Coq. Envir. Paris, p. 200, pl. 7, f. 3.

,, *sinuosus*, Brard, Coq. Envir. Paris, p. 201, pl. 7, f. 4.

Ancylus ,, Gras, Moll. Ter. et Fluv. France, pl. 5, f. 8.

Shell of a curved conical shape, more or less elevated, the height sometimes but little inferior to the breadth, very thin, and under its olivaceous epidermis bluish white both within and without, most minutely radiated externally with extremely fine and densely disposed slightly raised wrinkles, which are usually rather more evident in front. Sides not compressed, almost equal and similar; extremities well rounded and almost equal, the front being only slightly the broader. Apex lying far back, rather acutely peaked and hooked; the slope from thence forwards greatly arcuated, the hinder declination more or less abruptly and much incurved. Margin acute; side edges decidedly, though rather unequally, curved. Base simple, not indented. Length a quarter of an inch, breadth nearly two lines and a half.

The animal is of a rather pale grey hue, with darker specklings about the head; its tentacles are obtuse and triangular; its foot is ovate-oblong.

This little mollusk is abundant on stones in running brooks, clear streams, and rivers throughout the British Islands. Occasionally it is found adhering to plants, and here and there is taken in pools and ponds, but almost always where there is or has been running water flowing through.

There is no question as to this shell being the *Patella lacustris* of Linnæus; but, since the majority of conchological writers have applied that name to the next species, and since the designation *lacustris* is peculiarly inapplicable to this, we have retained the appropriate appellation given to it by Müller, and by which it is usually known.

A. oblongus, Lightfoot.

Elongated oblong: apex near the middle, directed to the left.

Plate CXXII. fig. 5.

Ancylus lacustris, Müller, Verm. Hist. pt. 2, p. 199.—Fleming, Brit. Animals, p. 280; Treatise Moll. Anim. pl. 7, f. 19.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 391. — Turt. Manual L. and F. W. Shells, p. 141, f. 126. — Thomps. Ann. Nat. Hist. vol. vi. p. 121. — Brown, Illust. Conch. G. B. p. 60, pl. 12, f. 3, 5, 7.—Drap. Moll. Ter. et Fluv. France, p. 47, pl. 2, f. 25, 27. — Voith in Sturm Deutsch. Fauna, sect. 6, pt. 4, pl. 8.— C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 109, pl. 4, f. 46.—Nils. Moll. Suec. Ter. et Fluv. p. 83.—Schub. and Wagn. Conch. Cab. vol. xii. p. 163, pl. 235, f. 4108.— Kickx, Moll. Brabant. p. 78. — Sowerby, Genera Shells, Anc. f. 2.—Desm. Bull. Linn. Bordeaux, vol. vii. pl. 1, b.— Gras, Moll. Ter. et Fluv. France, p. 65, pl. 5, f. 9.—Reeve, Conch. Syst. vol. ii. pl. 193, f. 2. — Mermet, Moll. Pyrén. p. 71. — Dupuy, Moll. Gers, p. 61. — Stein, Schnecken Berlins, pl. 3, f. 8.

Patella oblonga, Lightfoot, Phil. Trans. 1786, vol. lxxvi. p. 168, pl. 3, lower compartm.— Pult. Hutchins, Hist. Dorset, p. 51.— Donov. Brit. Shells, vol. v. p. 150.— Maton and Rack. Trans. Linn. Soc. vol. viii. p. 233. — Rack. Dorset Catalog. p. 58, pl. 18, f. 20*, and pl. 22, f. 8, *a.* — Turt. Conch. Dict. p. 138.— Dillw. Recent Shells, vol. ii. p. 1042. — Wood, Index Testac. pl. 37, f. 57.

Patella lacustris, Mont. (not Linn.) Test. Brit. vol. ii. p. 484.
Velletia „ Gray, Manual L. and F. W. Shells, p. 251, pl. 10, f. 126.

Shell but moderately elevated, with a more or less produced oblong base, extremely thin, semitransparent, and beneath a dirty horn-coloured or palely olivaceous yellow epidermis of an uniform smooth and shining snow-white hue both within and without. Sides compressed, or pinched as it were ; extremities moderately and often unsymmetrically rounded, the anterior end slightly the broader. Apex acutely peaked and hooked, decidedly behind the middle, manifestly bending to the left (towards which side, indeed, the entire shell is wont to incline); the slope from it forwards arched, the declination from it backwards a little concave. Margin acute, a little disposed to spread ; side edges but little curved. Base simple, neither raised at the ends and hollowed at the sides, nor hollowed at the extremities and laterally elevated. Length a quarter of an inch ; breadth a ninth or a tenth of an inch.

Animal dark-grey, dextral ; in other respects resembling the last.

This little shell is found adhering to the stems and leaves of water plants in ponds, lakes, and canals. It is generally distributed, though somewhat local, in England, Wales, and Ireland, but is rare in Scotland, occurring only in the south, as in Duddingston Loch, near Edinburgh.

AURICULIDÆ.

The animals of this tribe of *Pulmonifera* live, for the most part, in damp places, many of them on the immediate margin of the sea, so as to be moistened by the spray, or among salt marshes. Hence, not a few were for a long time believed to be inhabitants of the sea, and their shells were assigned to well known marine genera. They have broad but not widely lobed muzzles, bearing two subtriangular, cylindrical, or subulate contractile tentacula, with eyes at their inner bases or none. In their dentition they approach the *Limnæadæ*, having similar numerous uncinated teeth flanking a small symmetrical central one. Their foot is ovate, and obtuse behind; it bears no operculum. Their mantle is not reflected upon the shell, and is simple-edged; on the right side is the aperture of the pulmonary sac. They are bisexual (except *Carychium ?*).

Some of the tropical members of this tribe attain considerable dimensions. All have volutiform shells, very generally with denticulated apertures. In our native species the septa of the whorls in the spire become absorbed, so that the visceral extremity of the body ceases to be truly spiral.

CONOVULUS. Lamarck.

Shell spiral, ovate, usually thin; spire moderately produced. Aperture ovate or pyriform, entire, toothed within upon the columella, and sometimes in the throat; its peristome more or less thickened. Septa of the spire eventually obliterated. No operculum.

Animal with two subtriangular tentacula, and two sessile eyes placed at their inner bases. Foot rounded at both extremities, and often sulcated transversely in the centre, so as to divide it into two disks.

Some very interesting observations on the animals of the British species of this genus, by Mr. W. Clark, are contained in the Annals of Natural History, for December, 1850, and July, 1851.

C. bidentatus, Montagu.

White; outer lip simple, throat smooth; pillar with two folds.

Plate CXXV. fig. 1, 2.

Voluta bidentata, Mont. Test. Brit. Suppl. p. 100, pl. 30, f. 2. — Turt. Conch. Diction. p. 253. — Dillwyn, Recent Shells, vol. ii. p. 507. —Wood, Index Testac. pl. 19, f. 21 (magnified).
„ *alba*, (scarcely of Mont. Test. Brit. p. 235, not Suppl. p. 101, or of Maton and Rack. Trans. Linn. Soc. vol. viii. p. 130), Turt. Conch. Diction, p. 250.
Auricula bidentata (not Gould), Férus. Tabl. Syst. Moll. p. 103.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 368. — Brit. Marine Conch. p. 144.
„ *alba*, Férus. Tableau System. Moll. (no desc.). — Jeffreys, Trans. Linn. Soc. vol. xvi. p. 368.—Forbes, Malacol. Monens. p. 12. —Brit. Marine Conch. p. 145.
Volvaria „ Fleming, Brit. Animals, p. 333.
Acteon bidentatus, Fleming, Brit. Animals, p. 337.
Auricula erosa, Jeffreys, Trans. Linn. Soc. vol. xvi. p. 369.
Conovulus bidentatus, Gray, Manual L. and F. W. Shells, p. 227, pl. 12, f. 145. — Brit. Marine Conch. p. xxxiii. — Clark, Ann. Nat. Hist. new ser. vol. vi. p. 445.
„ *albus*, Gray, Manual L. and F. W. Shells, p. 227, pl. 12, f. 146. — Brit. Marine Conch. p. xxxiii. f. 25.
Auricula Micheli, Mittre, Révue Zool. Soc. Cuvier. 1841, p. 66?
Jaminia bidentata, Brown, Illust. Conch. G. B. p. 22, pl. 8, f. 7.
Auricula dubia, Cantraine, Bull. Acad. Sc. Brux. vol. ii. p. 383.; Mém. Acad. Sc. Brux. vol. xiii. p. 172?

Shell varying in shape from subfusiform-oval to oblong-conical, more or less solid, of an uniform ivory white beneath the pale yellowish horn-coloured skin, smoothish, or faintly wrinkled lengthways. Whorls six or seven, simply and only slightly convex, tapering above; the first four of slow increase, the penult, and occasionally the antepenult, rather suddenly enlarging; divided by a fine, and only moderately slanting, suture; the apex small, but not acute, rather obliquely coiled. Body filling from two-thirds to three-fifths of the dorsal length, sometimes a little ventricose above the middle; its basal declination gradual, not much rounded. Aperture usually occupying about four-sevenths of the ventral length, reversed semiovate, peaked above, narrowly rounded below. Outer lip simple, sharp, subarcuated, not much if at all expanded, except that it is a little effuse anteriorly, perfectly unarmed; throat quite smooth. Inner lip with only two folds, a very oblique one at the lower extremity of the columella, and a very prominent and comparatively horizontal one rather below the middle; not denticulated nor otherwise armed on the upper or parietal portion. Pillar lip appressed; no umbilical chink. Length of a very large individual a quarter of an inch; its breadth a line and a half. Variety *alba* * narrower in its aperture and general shape; spire consequently more produced; lower fold often nearly obsolete.

---

* The *Voluta alba* of the first volume of the "Testacea Britannica" (p. 235), and the *Jaminia alba* of Brown (Ill. Conch. p. 22, pl. 8, f. 18), seem derived from figure 61 of Walker and Boys' thin quarto, which appears to represent the *Cylichna obtusa*. A very different shell, said to have been found by Laskey in Dunbar sand, is described as *V. alba*, in Montagu's "Supplement" (p. 102). It was probably a minute foreign *Marginella*, but is not so defined that the species can be satisfactorily identified, being merely characterised as minute, ovate, with a slightly raised (worn) spire of probably three or four turns, a narrow mouth open below, as in *M. pallida*, yet not shaped as in that shell, and a pillar with four folds, besides some slight denticulations above them.

The animal is of a creamy white. Its tentacles are short, blunt, and subtriangular, diverging but approximated at their bases. The eyes are placed rather far back. The sole of the foot is sulcated across the centre, so as to form two creeping disks.

"The mantle is fleshy, and sometimes extends rather beyond the aperture of the shell; when it is viewed in the dead animal it has the aspect of the rounded tumid margin of the *Helices*. The neck is proportionately longer than in any other animal of its size I am acquainted with; and at its termination forms a veil divided by a sinuation in its centre into two arcuated lobes, from the right and left angles of which two very short, flat, setose tentacula spring. These vary, being in some animals more cylindrical; a little behind their origin the large subrotund eyes are seen at rather the internal bases: these appear dull, being imbedded within the skin. Beneath the neck-veil a narrow, flat, rather taper, grooved muzzle issues. The muzzle rests on the foot, which always outruns it a little. The pedal disk is moderately long, and rather broad, divided transversely very deeply at a third of its length; the other two-thirds taper gradually to a moderately rounded termination, sometimes slightly emarginate, and with a medial groove. The structure of the foot is that of *Pedipes;* its quality of locomotion perfectly agrees with the etymology of the term: it is very slow, in consequence of a double action of the pedal disk being necessary to effect progression, the anteal portion being first carried forward, accompanied by the head and neck, and is then fixed, when the posterior portion carrying the shell is drawn up to its predecessor or *pes pedi*, and so on, and thus a slow march is accomplished."—CLARK.

This pretty shell is most frequently found on our western shores, and in many places is common in crevices of rocks near high water-mark. Devon (Clark); Cornwall (Cocks); Weymouth, Ilfracombe, Swansea, and elsewhere on the South Wales coast (Jeffreys); Isle of Man (E. F.); Northumberland (Alder); Guernsey (S. H.). The variety *erosa* at Plymouth (Jeffreys); generally around the Irish coasts (W. Thomson).

NOTE.—We have not seen "Bivona, p. 22, pl. 2, f. 10," but think it likely, from Philippi's description (Moll. Sicil. vol. i. p. 143, as *Auric. myosotis, var. b.*; vol. ii. p. 118, as *A. Bivonæ*) of the *Ovatella bidentata* of that work, that it is identical with our species.

C. DENTICULATUS, Montagu.

Coloured; pillar lip usually with more than two teeth; outer lip often reflected; throat often denticulated.

Plate CXXV. fig. 3.

WALKER and BOYS, Test. Minut. Rariora, f. 50.

Voluta denticulata, MONT. Test. Brit. p. 234; Suppl. pl. 20, f. 5.—MATON and RACK. Trans. Linn. Soc. vol. viii. p. 130. — Dorset Catal. p. 44, pl. 18, f. 1. — TURT. Conch. Diction. p. 249. — BERKELEY, Zool. Journ. vol. v. p. 428, pl. 19, f. 3 (animal). — DILLW. Recent Shells, vol. i. p. 506. — WOOD, Index Test. pl. 19, f. 18.

Voluta ringens, TURT. Conch. Diction. p. 250.

„ *reflexa*, TURT. Conch. Diction. p. 251.

Auricula myosotis, var. a. FÉRUS. Tableau System. p. 103.

Acteon denticulatus, FLEMING, Brit. Anim. p. 337.

Auricula denticulata, JEFFREYS, Trans. Linn. Soc. vol. xvi. p. 367. — KÜSTER, Conch. Cab. I. sec. 16, pl. 8, f. 1 to 5.

„ *tenella*, MENKE, Synops. Mollusc. ed. 2 (1830), p. 131; Zeitschr. Malakoz. 1845, p. 33.

Carychium personatum, MICHAUD, Comp. Drap. Moll. France, p. 73, pl. 15, f. 24. 43.—GRAS, Moll. Ter. et Fluv. France, App. p. 16.

Pythia denticulata, BECK, Index Moll. Mus. (no description).

Auricula personata, DESH. in Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 334.—Brit. Marine Conch. p. 144.—PHILIPPI, Moll. Sicil. vol. ii. p. 118.

Conovulus denticulatus, GRAY, Manual Land and F. W. Shells, p. 225, f. 144. — Brit. Marine Conch. p. xxxiii. — ALDER, Moll. Northumb. and Durh. p. 41.

Jaminia denticulata, and *quinquedens*, Brown, Illust. Conch. G. B. p. 22, pl. 8, f. 6, 11.

Variety *Myosotis*, plate CXXV. fig. 4, 5.

Auricula myosotis, Drap. Moll. Ter. et Fluv. France, p. 56, pl. 3, f. 16, 17.—Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 330.—Blainv. Man. Malacol. pl. 37, bis, f. 6.— Desh. Enc. Méth. vol. ii. pt. 1, p. 88.—Lowe, Zool. Journ. vol. v. p. 290.—Philippi, Moll. Sicil. vol. i. p. 143 (*var. a.*); vol. ii. p. 118.—Küster, Conch. Cab. vol. i. sec. 16, pl. 8, f. 21 to 24.
Carychium myosote, Michaud, Comp. Drap. Moll. p. 73.—Gras, Moll. Ter. et Fluv. France, App. p. 16.
Voluta denticulata, Berkeley, Zool. Journ. vol. v. p. 428, pl. 19, f. 3.
Auricula „ Gould, Invert. Massach. p. 199 (chiefly), f. 129.—Dekay New York Moll. p. 58.

After a protracted examination we have decided upon uniting the *Auricula myosotis* of Draparnaud to the *Voluta denticulata* of Montagu. As many conchologists will dissent from this conclusion, we have scrupulously kept apart their description and synonymy. The followdetails pertain to the marine form *denticulata*.

Shell of a conical-oblong or oval shape, more or less thin and transparent, pale yellowish brown umber or horn-coloured, more or less faintly wrinkled lengthways, obsoletely subplicated, and in living specimens finely ciliated beneath the distinct yet simple suture. Spire varying greatly as to height, usually elongated for the genus, in the narrower examples often much produced, composed of from six to eight turns, that are of rather slow longitudinal increase, are well defined from their decided convexity, and taper above; apex moderately small, unsymmetrical. Aperture occupying fully one-half the length, oblong-lanceolate, narrowly rounded below, gradually contracted above to a curved and very acute angle; toothed on both sides. Outer lip more or less arched, strengthened internally at a little distance from the acute and somewhat expanded edge by a callous rim, on which are seated from three to six teeth (occasionally produced in ridges), which vary as to size and solidity. Inner lip with an oblique fold or pliciform tooth on the pillar, and with two central (besides, oftentimes, one or two additional posterior denticles) comparatively horizontal teeth, of which the lower is sublamellar and decidedly the larger and more prominent. No umbilicus, but the reflected pillar lip is not always thoroughly appressed anteriorly. Length of a large individual nearly the third of an inch; breadth almost two lines.

The animal is yellowish or bluish-white, with conspicuous and approximated eyes at the inner bases of its somewhat compressed tentacles.

This form always occurs in the neighbourhood of the sea. It is found in many localities, especially on the southern and western coasts of England. A variety occurs in vast abundance in ditches at Cobo in Guernsey (F. D. Lukis); in South Wales (Jeffreys); Loch Fyne (Jeffreys): "in crevices of the cliff a little above high water-mark at the south end of South Shields sands, rare" (Hancock). In the north, east, and south of Ireland (W. Thompson).

The shell of *myosotis* is precisely similar, except in the aperture, but for the most part stronger, and usually of a deeper tint of colouring, being sometimes chocolate-brown, and edged with white below the suture; more frequently, however, yellowish brown. Inner lip with only two or three teeth, the denticles being always, and the posterior tooth frequently, wanting; callosity of the outer lip solid, and either unarmed, or with only a single tubercular or dentiform projection where the rim is abruptly attenuated just below the site of the opposite posterior tooth.

The animal is yellowish tinged with grey.

This variety is found in brackish marshes about the estuaries of rivers, as in the Thames, as high as Greenwich, where it occurs in company with *Assiminea Grayana*, and furnished the subject of some of Mr. Berkeley's excellent researches; in the Avon, near Bristol, and on the banks of the Severn.

SPURIOUS.

C. BULLAOIDES, Montagu.

Voluta Bullaoides, MONT. Test. Brit. Suppl. p. 102, pl. 30, f. 4. — TURT. Conch. Diction. p. 254.
Tornatella „ FÉRUS. Tabl. Syst. p. 108.
Auricula „ GRAY, Annals of Philos. 1825, name only.
Melampus Bulla, LOWE, Zool. Journ. vol. v. p. 293 (no descr.).
Detracia Bullaoides, GRAY, Turt. Manual, p. 20 (as spurious).
Auricula cingulata, C. PFEIF. Wiegm. Archiv. Nat. 1840, p. 251, teste KÜSTER, Conch. Cab. I. sec. 16, p. 40, pl. 6. f. 4, 5, 6.
„ *oliva*, D'ORBIG. Cuba Moll. pl. 13, f. 8, 9. 10.

A native of St. Vincent's, admitted as British by Montagu, on the authority of the Portland collection.

C. PUSILLUS, Gmelin.

Voluta pusilla, GMEL. Syst. Nat. p. 3436 (from MART. Conch. Cab. vol. ii. pl. 43, f. 446).—DILLW. Recent Shells, vol. i. p. 507.
Voluta triplicata, DONOV. Brit. Shells, vol. iv. pl. 138.—MONT. Test. Brit. Suppl. p. 99. — TURT. Conch. Diction. p. 253. — FLEMING, Encycl. Edin. pl. 203, f. 13.—DILLW. Recent Shells, vol. i. p. 507.—WOOD, Index Testac. pl. 19, f. 19.
Auricula nitens, LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 332 (probably,) from which *Melampus ovulum*, LOWE, Zool. Journ. vol. v. p. 289.
Auricula ovula, POTIEZ and MICH. Gal. Douai Moll. vol. i. p. 204, pl. 20, f. 13, 14.
Tralia pusilla, GRAY, Manual L. and F. W. Shells, p. 21, as spurious (no descr.).

A native of the Antilles, introduced by Donovan, because Da Costa had erroneously supposed it to be identical with one of Walker's figures; supposed also, wrongly, to be a native of Guernsey. The Acteon triplicatus *of Fleming (Brit. Anim.*

p. 337) is apparently derived from Donovan; if so, the "body lip with two folds," is a misprint for "three."

CARYCHIUM. Muller.

Shell spiral, oblong, cylindrical, thin, with a moderately turreted spire; aperture oblong, subcontracted, toothed; peristome thickened. No operculum.

Animal with two cylindrical obtuse tentacles, with eyes at their internal bases.

The species of this genus are exceedingly minute.

C. minimum, Müller.

Plate CXXV. fig. 6.

Carychium minimum, Müller, Verm. Ter. et Fluv. vol. ii. p. 125. — Jeffreys, Trans. Linn. vol. xvi. p. 365.—Flem. Brit. Anim. p. 270. — Turt. Conch. Man. p. 96, f. 77; ed. Gray, p. 221, pl. 7, f. 77. — Brown, Illust. Conch. G. B. p. 34, pl. 18, f. 15, side figs. — Kickx, Moll. Brabant. p. 51. — Sow. Conch. Man. f. 301. — Cantr. Bull. Brux. vol. xiii. p. 169. — Rossmässl. Iconog. Land und Süssw. Moll. pt. 10, f. 660. — Küster, Conch. Cab. I. sec. 16, pl. 1, f. 8, 9, 10. — Gras, Moll. Ter. et Fluv. France, p. 54, pl. 4, f. 23. — Mermet, Moll. Pyrén. p. 56. — Dupuy, Moll. Gers, p. 44.

Turbo carychium, Gmel. Syst. Nat. p. 3665. — Mont. Test. Brit. p. 339, pl. 22, f. 2; Suppl. p. 132.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 184.—Rack. Dorset Catalog. p. 52, pl. 19, f. 13. — Ture. Conch. Diction. p. 221. — Dillw. Recent Shells, vol. ii. p. 880.—Wood, Index Test. pl. 32, f. 157.

Auricula minima, Drap. Moll. Ter. et Fluv. France, p. 57, pl. 3, f. 18, 19. — Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 330. — Nils. Moll. Suec. Ter. et Fluv. p. 55. — Philippi, Moll. Sicil. vol. ii. p. 222.—Stein, Schnecken Berlins, pl. 2, f. 5.

Odostomia carychium, Fleming, Edinb. Encycl. vol. vii. pt. 1, p. 76.

Auricella „ Hartmann, in Sturm Deutsch. Fauna, pt. 7, pl. 1.
Walker and Boys, Test. Minut. Rariora, f. 51.

Shell oblong, or elongated oblong, somewhat tapering above, rather thin, transparent, and shining, of an uniform whitish or yellowish white hue, smooth to the eye, but under a lens densely striolate lengthways. Whorls five or five and a half, rounded, of moderate longitudinal increase, divided by a simple profound, and not much slanting suture; penult volution more than twice as broad, in general, as it is long; apex very blunt. Body not swollen, quickly commencing its anterior attenuation; basal declination convex and gradual. Peristome a little interrupted. Mouth filling about two-fifths of the total length, obliquely suboval, the regularity of the shape, however, disturbed by the three teeth; well rounded, entire, and disposed to expand anteriorly. Both lips broadly reflected; the outer one prominent, somewhat thickened internally, obliquely arcuated, and furnished, rather above its middle, with a broad and strong tooth. Inner lip with a narrow and much projecting tooth in the middle; pillar lip straightish at its left edge, not appressed, provided near its anterior extremity with a subpliciform tooth. Axis imperforated.

Variety. With the teeth, especially that on the right lip, more or less obsolete. Length one line.

The animal of this little shell is creamy white, with disproportionately large black eyes at the bases of the short and blunt tentacula.

This shell is found in all parts of the United Kingdom, except, perhaps, in the extreme north; it inhabits moist places among moss and grass, often on the surfaces of moss-clothed rocks, beside trickling water.

CYCLOSTOMIDÆ.

The operculated Pulmonifera differ in such important features of their organization from all other pulmonated Mollusks, that their true position in the series of *Gasteropoda* is a subject of dispute, not yet satisfactorily settled. In many points of their anatomy they are distinctly related to the snail tribe; in others they seem to have affinity with *Littorina* and similar *Pectinibranchiata*. Their ancient embodiment in the genus *Turbo* had a significance even stronger than that indicated by the shapes of their shells. The attention they are now receiving from many able malacologists will probably clear up many doubts respecting their systematic rank. In the meantime, we describe the very few British representatives of the group at the close of the *Pulmonifera*, a place not unnatural when we consider the relations of *Acme* with *Carychium*.

The genera *Cyclostoma* and *Helicina* are the principal types of the family. Of the latter we have no British members, nor, indeed, are there any inhabiting the temperate regions of the globe. The old genus *Cyclostoma* has been lately divided into numerous lesser but important groups, chiefly characterised by differences in the structure and form of their opercula. In the newly-published "Conspectus Cyclostomaceorum," by Dr. Louis Pfeiffer, no fewer than twenty-nine of their genera are enumerated, including above four hundred and fifty species. The generic name *Cyclostomus* is restricted to an assemblage of seventy-nine species, one of which is the only true representative of the group inhabiting the British Isles. With a doubt, we have included as its associate in the same family, the curious genus *Acme*.

CYCLOSTOMA. Montfort.

Shell globoso-turbinate, ovato-turreted or depressed, often strong, variously sculptured: aperture oval, with a simple, straight, or expanded peristome. Operculum suboval, testaceous, plane, exhibiting four or five whorls, its margin simple, its nucleus subeccentric.

Animal with a probosciditorm muzzle, two subulate tentacles, eyes at their external bases; foot ovate; mantle quite free; sexes distinct.

Even in its most restricted sense, this genus includes no fewer than eighty species, the great majority of which are tropical.

C. elegans, Müller.

Plate CXXII. fig. 3.

Turbo reflexus, Linn. Syst. Nat. ed. 12, p. 1238 (inadequately described) from type.

Nerita elegans, Müller, Verm. Hist. vol. ii. p. 177.

Turbo tumidus, Penn. Brit. Zool. ed. 4, vol. iv. p. 128, pl. 82, f. 110.

„ *striatus*, Da Costa, Brit. Conch. p. 86, pl. 5, f. 9.—Donov. Brit. Shells, vol. ii. p. 59.

„ *elegans*, Mont. Test. Brit. vol. ii. p. 342, pl. 22, f. 7.—Maton and Rack. Trans. Linn. Soc. vol. viii. p. 167.—Rack. Dorset Catalog. p. 50, pl. 21, f. 9.—Turt. Conch. Diction. p. 207, f. 48, 49.

Cyclostoma „ Drap. Moll. Ter. et Fluv. France, p. 32, pl. 1, f. 5, 8.—Fleming, Brit. Animals, p. 257.—Jeffr. Trans. Linn. Soc. vol. xvi. p. 362.—Berkeley, Zool. Journ. vol. iv. p. 278, anatomy.—Turt. Manual L. and F. W. Shells, p. 93 (ed. Gray, p. 275), f. 75.—Thompson, Ann. Nat. Hist. vol. vi. p. 126.—Brown, Illust. Conch. G. B. p. 34, pl. 14, f. 28, and pl. 18*, f. 29.—Brard, Coq. Envir. Paris, p. 103, pl. 3, f. 78.—C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 1, p. 74, pl. 4, f. 30, 31.—

LAM. Anim. s. Vert. (ed. Desh.) vol. viii. p. 360. — HARTM. in Sturm Deutsch. Fauna, pt. 7, pl. 3.—KICKX, Moll. Brabant. p. 69. — ROSSMÄSSL. Iconog. Land und Süssw. Moll. pt. 1, p. 90, f. 44; pl. 5, f. 81, animal.— PHILIPPI, Moll. Sicil. vol. i. p. 143; vol. ii. p. 119. — GRAS, Moll. Ter. et Fluv. France, p. 55, pl. 4, f. 25. — MERMET, Moll. Pyrén. p. 72. — DUPUY, Moll. Gers, p. 63. — SOWERBY, Thesaur. Conch. vol. i. p. 101, pl. 23, f. 32, 33. — KÜSTER, Conch. Cab. vol. i. sec. 19, pl. A, f. 1 to 3 (animal).

Shell ovate-conic to oblong-conic, tolerably strong, not polished, only a little transparent, pale purplish or livid grey, mottled with purplish brown or pale violet liver colour, sometimes in cloudy longitudinal waves, sometimes in the form of two, or more frequently three, spiral bands of irregular angulated spotlike markings; top whorls usually wholly livid, brown, or purplish. Surface densely encircled by blunt costellar striæ, that are about as broad as their intervals, and are very nearly of the same size throughout each volution; decussated, likewise, by still more closely set minute lamellar striæ, that are chiefly perceptible in the spiral interstices. Whorls about five, tumid, simply rounded, of moderate longitudinal increase, divided by a simple suture, which is not crenated beneath; apex blunt, not particularly small. Body about as long as the spire; its basal declination abruptly rounded. Mouth filling about three-sevenths of the ventral length, almost orbicular, but with a very obtuse angle above, where the otherwise free peritreme is attached to the body; throat smooth, reddish fawn colour; peritreme whitish or yellowish white, rather advancing anteriorly, not thickened; outer lip simple, acute, a little disposed to expand; pillar lip a little turned back, the space behind it not differing either in sculpture, convexity, or markings from the rest of the surface. Umbilicus neither large nor profound. Operculum spiral, solid, pale horn-coloured, flattish externally, with most minute wrinkles obliquely radiating from the almost imperceptible sutural line. Length seven lines; breadth a third of an inch.

The colour of the animal is dark brown, deepening beneath. Its head is elongated, and bears subulate tentacles, with obtuse clavate tops; the eyes are placed at their thickened external bases; the foot is oval and rounded at both extremities: the mantle has a crenulated edge. An elaborate account of its anatomy by the Rev. M. G. Berkeley, is contained in the fourth volume of the "Zoological Journal."

This pretty shell is abundant in many of the southern counties, especially in cretaceous districts, where it may be collected plentifully at the roots of brushwood. It is not found in Scotland, nor in the slaty districts of the west of England. It is found in Devon. It occurs at Helmsley and Thorpe (Hincks), and elsewhere in Yorkshire, and in "one locality near the sea on a limestone promontory in the Kendal district" (T. Gough). It is said to be found near Sedbury in Worcestershire (G. Reece).

It seems never to have been taken alive in Ireland in localities where it could be regarded as strictly indigenous. A specimen was found at Youghal by Mr. Wright, and Mrs. W. J. Hancock met with as many as a hundred dead shells washed on shore near Bundoran, on the west coast, in one day (W. Thompson).

This species is reported as Scotch, through a mistaken reading of the description of *Cyclostoma marmorea*, a shell described by Captain Brown in the "Edinburgh Journal of Natural and Geographical Science" (vol. i. p. 13, pl. 1, f. 10, 11), from a specimen said to be British, in the cabinet of Mr. Gerard. The example alluded to appeared to be a nearly smooth variety of *C. elegans*.

SPURIOUS.

C. FERRUGINEUM, Lamarck.

Cyclostoma ferruginea, Lam. Anim. s. Vert. (ed. Desh.) vol. viii. p. 358.—Deles. Rec. Coq. Lam. pl. 29, f. 4.

Turbo fulvus, Wood, Index Testac. Suppl. pl. 6, f. 9.

Cyclostoma productum, Turt. Manual L. and F. W. Shells, p. 94, f. 76.

„ *ferrugineum*, Potiez, and Mich. Gal. Douai, Moll. pl. 24, f. 7, 8.—Rossmässl. Iconog. Land und Süssw. Moll. pt. 6, p. 49, pl. 28, f. 396. — Gray, Manual L. and F. W. Shells, p. 16, f. 76, as spurious. — Brown, Illust. Conch. G. B. pl. 14, f. 29, 30 (do.). — Sowerby, Thes. Conch. vol. i. pl. 24, f. 55, 56, 57.

A native of Algiers, the Balearic Isles and the South of Spain; said by Turton to have been found near the shore in the West of Ireland.

ACME. Hartmann.

Shell turreted, cylindrically oblong, shining; aperture ovate, entire, toothless, columella subperforate. Operculum subspiral, very thin, and corneous.

Animal with rather slender and long tentacles, the eyes placed at their hinder bases. Foot sharp behind.

The name of this genus is unfortunately much too near that of *Acmæa* applied to shells of very different affinities.

A. LINEATA, Draparnaud.

Plate CXXV. fig. 7.

Turbo fuscus, Mont. Test. Brit. p. 330, from Boys and Walker, Test. Minut. Rariora, pl. 2, f. 42. — Maton and Rack. Trans. Linn. Soc. vol. viii. p. 186.—Turt. Conch. Diction. p. 229.—Wood, Index Test. Suppl. pl. 6, *Turbo*, f. 15 (and as *Auricula fusca*).

Auricula lineata, Drap. Hist. Moll. Ter. et Fluv. France, p. 57, pl. 3, f. 20, 21.

Carychium cochlea, Studer, Syst. Verz. Schweiz. Conch. (teste Rossmässl.)

„ *lineatum*, Férus. Tableau Syst. Moll. p. 100.— C. Pfeif. Deutsch. Land und Süssw. Moll. pt. 3, p. 43, pl. 7, f. 26, 27.—

Rossmässl. Iconog. pt. 5, p. 54, pl. 28, f. 408.—Potiez, and Mich. Gal. Douai, Moll. vol. i. p. 199 (animal).—Gras, Moll. Ter. et Fluv. France, p. 54, pl. 4, f. 24.

Cyclostoma lineatum, Férus. Dict. Cl. Hist. Nat. vol. ii. p. 90.

Acme lineata, Hartm. in Sturm Deutsch. Fauna, sect. vi. pt. 7, pl. 2.—Alder, Trans. Nat. Hist. Soc. Northumb. and Durh. vol. ii. p. 338; Cat. Moll. Northumb. and Durh. p. 41.

Carychium fuscum, Fleming, Brit. Anim. p. 270.—Jeffreys, Trans. Linn. Soc. vol. xvi. p. 364, 517.

Bulimus lineatus, Turt. Manual L. and F. W. Shells, p. 83, f. 66.

Acme fusca, Gray, Manual L. and F. W. Shells, p. 223, pl. 6, f. 66.—Thompson, Ann. Nat. Hist. vol. vi. p. 117.—Brown, Illust. Conch. G. B. p. 34, pl. 18*, f. 28.

„ *minuta*, Brown, Ill. Conch. G. B. p. 35, pl. 14, f. 26?

Shell minute, narrow, the length being to the breadth as three to one, cylindrical, but tapering convexly above to a rounded apex, of an uniform highly polished clear transparent brownish amber colour, striated throughout by distant longitudinal scratchlike lines. Whorls six, deeply divided by a moderately slanting suture, near which they are decidedly convex, though not much rounded in the middle, of only moderate longitudinal increase; the penult and antepenult turns rather long; body short, its basal declination rather abruptly rounded. Mouth only filling about a fourth of the total length; much contracted above, bluntly rounded below, of a rhombic-ovate shape, the pillar distinctly forming an obtuse angle with the parietal or upper portion of the inner lip. Outer lip simple, acute, not prominent, straightish above, rather suddenly arcuated below. Pillar lip nearly straight, rather long, a little reflected over the umbilical crevice.

The operculum was first noticed, we believe, by the Abbé Dupuy. It is very fugacious, horny, exceedingly thin, oval in outline, transparent, and subspiral.

Length of shell only a tenth of an inch.

Animal varying in colour from white to dark brown.

Its shape is elongated, the head proboscideform, the tentacles long and subulate. The eyes are placed directly behind the tentacles, from which they are separated by a series of specks arranged semicircularly.

This little mollusk is a rare species, not found in Scotland, and local in England and Ireland; on the whole, southern and western in its distribution. Penzance (Cocks); Devon, Bristol (Turton); Pembrokeshire (Jeffreys); Helmsley, Yorkshire (Hincks); Northumberland, rare (Alder). Widely distributed, but rare, in Ireland. Clare, on sand hills (Harvey); Down, Antrim, Dublin, &c. (Thompson).

A reversed variety among the rejectamenta of the Avon (Jeffreys).

CEPHALOPODA DIBRANCHIATA.

At the head of the Mollusca are the Cuttle-fishes, animals whose aspect and actions remind us of Vertebrata, and whose structure indicates a high type of organization as compared with those of other molluscous tribes. These remarkable mollusks are distinguished from their gasteropodous relatives externally by the position and shape of their principal prehensile and locomotive organs; these are arm-like processes springing from the head, and surrounding the mouth, which is armed with powerful jaws resembling the bill of a bird. The so-called mantle is a sleeve-like investment of the visceral sac, and in certain tribes, now for the most part extinct, was protected by a shell often of singularly complicated structure. The head is strengthened by a cartilaginous skeleton, which serves to protect the highly-concentrated cephalic ganglions. The organs of sense are highly developed. The gills are symmetrically arranged plumes, lodged in a cavity which opens beneath, with a fleshy siphonal tube springing from the back of the neck at its orifice. The sexes are separate. All Cuttle-fishes inhabit the sea.

These animals play such an unimportant part in the fauna of the British seas, that we should scarcely be warranted in discussing at length the numerous questions of interest connected with the class. Those that now live on our coasts are members of the Dibranchiate order; a group characterised by the development of a distinct head provided with sessile though conspicuous eyes, horny jaws, acetabuliferous arms, two branchial plumes, an ink-gland, a complete siphon, and a shell which is very rarely external, usually internal and penshaped.

OCTOPODIDÆ.

The cuttle-fishes of this family have mostly more or less globose, inflated bodies, unprovided (except in a single genus, and that not represented in the British seas) with fins. They have rather small heads, prominent eyes protected by eye-lids, fleshy lips to their mouths, and strongly curved compressed beaks. Their arms are eight in number, and all similar though more or less unequal; they bear sessile suckers. The mantle is always attached to the neck. The members of this group have no internal pen or shell. In the genus *Argonauta*, however, we find an external shell developed. They are active animals, swimming and creeping with facility, but living chiefly among the crevices of rocky ground.

Their eggs are globular, firm, and united in bunches of comparatively few.

OCTOPUS. Lamarck.

Animal with a rounded or oblong body; head bearing eight similar arms provided with two rows of sessile suckers on their inner surfaces, and connected by an interbrachial web near their bases. Beak strongly compressed.

The species of this genus were the *Polypi* of the ancients. Leach proposed to retain the name *Polypus* for the group, but the general use of the Lamarckian appellation induces us, independent of its partial priority, to retain it.

O. VULGARIS, Lamarck.

Plate NNN. fig. 2.

Sepia octopodia, LINN. Syst. Nat. ed. 12, vol. i. p. 1095.
,, *octopus*, Bosc. Vers. vol. i. p. 47.—BRUG. Encycl. Méth. pl. 76, f. 1–4.
Polypus octopodia, LEACH, Zool. Misc. vol. iii. 139; Journ. de Phys. vol. lxxxvi. p. 394. — SAVIGNY, Desc. de l'Egypte. Hist. Nat. vol. ii. pl. 1, f. 1.
Octopus vulgaris, LAM. Mem. Soc. Hist. Nat. Paris, vol. i. p. 18; An. sans Vert. vol. vii. p. 657. — CARUS, Nov. Act. Ac. Nat. Cur. vol. xii. pt. 1, pl. 31, p. 319. — D'ORBIG. Tabl. des Ceph. p. 52, No. 1. — BLAINVILLE, Dict. des Sc. Nat. vol. xlii. p. 188.—RISSO, Hist. Nat. Eur. Mer. vol. iv. p. 3.—DELLE CHIAJE, Mem. vol. i. p. 2 t. 1. — SOWERBY, Brit. Misc. p. 101, pl. 48. — FLEMING, Brit. An. p. 253. — PHILIPPI, Enum. Moll. Sic. vol. i. p. 240. — FÉRUS. and D'ORBIG. Ceph. Acet. pl. 2, 3, 3 bis, 8, 11, 12, 13, 14, 18, 29, p. 27. —D'ORBIG. Moll. des Canaries, p. 14 ; Moll. Viv. et Foss. vol. i. p. 169, pl. 1, f. 7–9. — VERANY, Moll. Med. pt. 1, p. 16, pl. 8.

Although this cuttle-fish is commonly believed to be not scarce, there is reason to regard it as one of the rarer British species. We have never had the good fortune to take it alive in the British seas, and but few of our zoologists appear to have met with it. The only drawing taken from a living British example, with which we are acquainted, is that made so long ago as 1805, by Mr. James Sowerby. Fortunately this, although there are some important details not indicated, is very good, and rather than give a figure from a specimen preserved in spirits, we reproduce it here. The best foreign figures are the admirable lithographs of Verany.

The body of the *Octopus vulgaris* is oval, and somewhat rounded, of small size as compared with the head and arms, but not so small in proportion as it is in several other species. It is covered with flattened tubercles, and all who have described its appearance when alive state that, when irritated, unequal prominent tubercles appear upon it, symmetrically arranged. Its colour is tawny grey above, with brownish spots marking the position of the warts. The intensity of its hues, as in other cuttle-fishes, is exceedingly variable and transient. The back of the arms and the head are similarly coloured, but beneath and around the funnel it is bluish white. The head is large, warty, with prominent eyes, above which (though not marked in Sowerby's figure) three cirrhi are placed. The pupil of the eye is round. The arms are thick, and gradually tapering: on their inner surfaces are seen the sessile suckers arranged in double rows. Near the mouth these suckers become smaller. Dr. Grant remarks that there are about 240 suckers on each arm, 1920 in all. The bases of the arms are strongly webbed together. The length of the arms is about thrice that of the body, or a little more. This species grows to a considerable size. Verany mentions his having once seen a specimen three metres in length. This excellent observer states of its habits, that it lives among rocks, hidden in holes and crevices, where it watches for the approach of the animals upon which it preys. Sometimes it inhabits sandy ground, establishing itself in the midst of a sort of crater of pebbles, piled up for a hiding-place.

The first recorded British specimen was taken by Mr. Richard Phillips at Dover. Dr. Grant states that he had met with it in the Frith of Forth. Dr. Robert Ball procured it at Plymouth in 1841.

The reputed Irish localities are very doubtful.

The *Octopus tuberculatus*, of Blainville, distinguished by its shorter arms, short globular body, and dark violet brown colour, inhabits the Channel on the coasts of France, and should be sought for on our own shores.

ELEDONE. Leach.

Animal with an oval body; its head furnished with eight nearly equal arms, provided with sessile suckers ranged in single file on their inner sides. Sexes similar.

This genus has scarcely sufficient claim to be kept distinct from *Octopus*. Such a species as the *Eledone macropodius* of some authors, *Octopus* of others, which was the original Ελεδονη of Aristotle, links the two groups together.

E. cirrhosus, Lamarck.

Plate KKK. fig. 4, and MMM. fig. 1.

Sepia octopodia, Pennant, Brit. Zool. vol. iv. p. 53, pl. 28, f. 44.
Octopus cirrhosus, Lam. Mem. Soc. Nat. Hist. de Paris, vol. i. p. 21, pl. 1, f. 2, *a*, *b*.; An. Sans Vert. vol. vii. p. 658. — Férus. and D'Orbig. Tab. Méth. des Ceph. p. 56. — Blainv. Dict. des Sc. Nat. vol. xlvii. p. 191.
Sepia cirrhosa, Bosc. Vers. vol. i. p. 47.
Octopus octopodia, Fleming, Brit. An. p. 254.
„ *ventricosus*, Grant, Ed. New Phil. Jour. vol. ii. p. 309. — Johnston, Berw. Nat. Club, vol. i. p. 197.—Ball, Proc. Royal Irish Acad. vol. ii. p. 193.
Eledone Pennantii, Forbes, Malac. Monensis, p. 1. — Macgilliv. Moll. Aberd. p. 31.
„ *cirrhosus*, D'Orbig. and Férus. Ceph. Acet. pl. 2. — Lovén, Index Moll. Scand. p. 3. — D'Orbig. Moll. Viv. et Foss. vol. i. p. 194.—Verany, Moll. Med. pt. 1, p. 15.
„ *ventricosa*, Alder, Moll. Northumb. p. 13.

The body is ovate (often four or five inches in length by three or four in breadth) truncate anteriorly, rounded posteriorly, slightly depressed on the back, where the skin is minutely granulated. Beneath it is smooth. The siphon is somewhat conical and pale. The head is broad, depressed in the centre, very prominent on each side above the eyes, where there are the rudiments of cirrhi, distinctly manifested when the animal is alive, but becoming obsolete and apt to be overlooked in dead specimens. The eyes are small but conspicuous, and have no eye-lids. The eight arms (each of which is often a foot in length) are unequal, united at their bases by a strong web, which connects them for some distance, about a fourth of their length, and is faintly decurrent on their free portions. The suckers are ranged in a close row on their under surfaces. Dr. Grant reckoned one hundred and eleven of them on each arm of a specimen, the arms of which were a foot long. Each sucker is round, sessile, strongly margined and radiated within. These organs become very small towards the extremities of the arm. As in all the kinds of cuttle-fishes the colouring varies greatly, according to the liveliness of the animal, and probably also according to the locality. Dr. Grant describes this species as marked with small reddish brown spots on the back, and being smooth and light-coloured on the fore-part. Professor Macgillivray's example in spirits was dusky above, smooth, and yellowish white below. Whenever we have taken it ourselves, and observed it when full of vivacity, it has exhibited a rich reddish or sienna brown clouded with darker and lighter blotches on the back and head ; pale below. Over the eyes we have observed a bluish tinge or blotch in the region of the cirrhi. The eyes themselves were intense blue, with whitish eyelids. The upper surface of arms was speckled and clouded with rich red-brown, becoming pale tawny on their sides. The web of the arms was speckled with brown. The siphon was pale, with brown specks, but no blotches. The suckers were pale or white, tinged with a circle of tawny within the ring. The region around the mouth was pale.

We have given two figures of this interesting cuttle-fish, both drawn from life, from different examples. The differences will serve as warnings to those who would derive specific characters in this genus from slight variations of form and colour. The second of these figures (Plate MMM, fig. 1) represents the attitude assumed by an individual taken in the Sound of Skye, and placed in a large vessel of salt-water, where it rested in the manner delineated, adhering by its suckers, spreading out its webbed disk, carrying its funnel on one side, elongating its body, and curling two of its arms (the ventral ones) in such a manner on the sides of the body that we might almost fancy that they shadowed out, as it were, the shape of an argonaut shell, to the tubercles of whose dorsal keel the graduation of sizes of suckers much better correspond, in this case, than do those which are seen on the webbed dorsal arms of the constructor of the paper nautilus. When taken out of the water the body at once assumed a more globular shape.

We have taken the *Eledone* in twenty-five fathoms off the coast of the Isle of Man, and in depths from twenty to twenty-five fathoms among the Hebrides, and on the coast of Donegal. Dr. Grant procured it in the Frith of Forth; Mr. Macgillivray at Aberdeen; Mr. Alder on the Northumberland coast; Dr. Johnston frequently in Berwick bay; Colonel Montagu on the coast of Devon; Mr. Ball at Youghall and Dublin.

The aspect of the specimen represented in Plate NNN, fig. 2, suggests that the animal described by Professor Macgillivray under the name of *Eledone Aldrovandi* (Mollusca of Aberdeenshire, page 32) may be only another state, or slight variation of the same. We transcribe his account of it:—

" Body elliptical, somewhat flattened, much rounded at the end; with the surface even, smooth, and of a bluish-white colour. The margin of the sac free, unless at the back, where it is continuous with the skin of the head. Measured across the eyes the head is narrower than the body, but seems larger, owing to the great size of the bases of the arms. The eyes, although large, are comparatively small. The head is crowned by a circle of large, fleshy, compressed tapering arms, of unequal length, and extremely slender at the end; the dorsal arms shortest—the ventral pair longest. They are covered internally with a single series of sessile cups elevated on broad tubercles, of which there are from sixty to seventy. These suckers are not in mutual contiguity, but placed at a little distance from each other, and enlarge from the first to the fifth, which measures three-twelfths across; the horny portion cup-shaped or hemispherical. For more than a third of their length the arms are connected by wide membranes, the margins of which run out upon them. The mandibles are brownish black with a portion of the base white." The length of the sac was three inches six lines, that of the longest (the ventral) arms three inches nine lines, of the shortest (dorsal) ones two inches ten lines. The body was smooth and white.

We cannot reconcile this account with the *Eledone Aldrocandi* of Delle Chiaje, as described at length and beautifully figured by Verany. That species, like our *E. cirrhosus*, differs from the common Mediterranean *moschatus* in the absence of a musky odour, and of a vivid blue border to the brachial veil. Mr. Thompson suspected that a specimen of *Eledone* in his possession, from Belfast bay, might be distinct from the common one.

TEUTHIDÆ.

The squids and cuttle-fishes, commonly so called, belong to the Decapodous division of the Dibranchiate Cephalopoda. The mollusks of this section have ten arms, two of which differ in length, shape, and insertion, from the rest, and are usually designated tentacula. The suckers on these arms are stalked. The eyes are capable of free motion. The siphon is usually provided with a valve. In shape they are often elongated, and always furnished with fins. Their shell is internal: in some it is a horny pen; in a few it is the body called cuttle-bone; more rarely it is a chambered shell, variously combined with pen, or bone, or gourd. The *Teuthidæ* have variously shaped bodies; in the majority of species it is elongated, with fins occupying a portion of the length; their shell is a horny pen, consisting of an axis, and more or less developed side-wings.

SEPIOLA. Leach.

Body oval or rounded, short, united to the head by a broad ligament, and furnished on each side with a suborbicular fin. Constricting apparatus at the base of the locomotive tube, and constituted of a pair of elongated furrows, corresponding to linear crests on the inner wall of the sleeve. Head short, but large, bearing ten arms, of which two are tentacular and retractile. Eyes covered by an expansion of epidermis. Pen corneous, flexible, small, blade-shaped.

"The sepiola, the minutest of the Naked Cephalopods, possesses a structure as complex and elaborate as that of the largest *Octopus* or *Loligo*. By the magnitude of its cephalic arms, and their numerous large pedunculated suckers, it compensates for the want of developed suckers on its long tentacula. By the great development of its ink-gland, and the magnitude of its organs of vision, it compensates for the want of more solid means of protection. The rounded form of its body required the dorsal lamina to be shortened, which would have impeded the motions of the mantle had it extended, as in the *Loligo*, to its extremity. The great muscular strength of its dorsal fins, and the mobility of their *scapulæ*, give rapid and varied motion to this delicate and defenceless animal; and they constitute the most perfectly developed arms of this class. Its organs of secretion are all largely developed—its salivary, hepatic, pancreatic, and ink glands. Its digestive, circulating, and respiratory organs, are constructed according to the most perfect form of the cephalopodic type; and the great development of its generative apparatus is well adapted to repair the rapid destruction of its race."—GRANT.

These pretty little cuttle-fishes are active creatures inhabiting very various depths of water in the laminarian and coralline zones. They are regarded as a delicacy by the Italians.

One species only has hitherto been recognised in the British seas, and this has always been identified by our naturalists with the common *Sepiola* of the Mediterranean. Gervais and Van Beneden in 1838 maintained that the *Sepiola* of the Atlantic coasts of Europe was different from that inhabiting the Mediterranean. The distinctions, indicated by them, however,* were quite insufficient to warrant the inference drawn by these observers. M. Alcide D'Orbigny was the first to determine a true and important difference, but likewise committed the error of supposing that all the Atlantic individuals were of one type, and the Mediterranean ones of another. He consequently referred all the figures and descriptions of British and Channel *Sepiolæ* to his *S. Atlantica* (those of Pennant, Bouchard, Gervais and Van Beneden, and Thompson), and those of Mediterranean individuals to *S. Rondeletii*. It will be seen that we have both these species in the British seas. Owing to the distinctive characters having been entirely overlooked it is impossible now to say which kind was intended by British authors who quote this cuttle-fish under the names of *Loligo sepiola*, *Sepiola vulgaris*, and *S. Rondeletii*. Under these circumstances we think it best to restrict our synonyms and not include doubtful references.

---

* Bulletin de l'Acad. Roy. de Bruxelles, vol. v. p. 421.

1. S. ATLANTICA, D'Orbigny.

Suckers becoming suddenly four-ranked, crowded, and very minute at the extremities of the lower pair of arms.

Plate MMM. fig. 2.

Sepiola Atlantica, D'ORBIG. and FÉRUS. Ceph. Acet. p. 283, *Sepioles*, pl. 4, f. 1–12.—D'ORBIG. Moll. Viv. et Foss. p. 247, pl. 10, f. 1–12.
Sepiola vulgaris, GRANT, Zool. Trans. vol. i. p. 77, pl. ii. f. 3–13 ? — GERVAIS and VAN BENEDEN, Bull. Acad. Brux. vol. v. p. 428 ?
,, *Rondeletii* and *vulgaris*, in part, of British Local Catalogues.

This, apparently the most common *Sepiola* of our seas, seldom measures more than an inch in length in the body, and a rather shorter distance from the junction of the head with the body to the extremities of the arms. The body is somewhat bell-shaped, rounded behind, truncated in front, and joined to the head above by a broad band. Two large ovate fins flank its sides, and are inserted rather towards the dorsal aspect. The head is rather short, broad, centrally depressed, bulging over the large eyes. The eight arms are unequal, stout and tapering; the suckers on their inner surfaces are about two-rowed, rather small and gradually diminishing. The terminal suckers of the lower pair of arms suddenly diminish and become many-rowed. The tentacular arms have rather stout peduncles, and do not reach as far back as those of the next species; their tips are slightly dilated and bear exceedingly minute suckers. The colour of a specimen delineated from the life by Mr. Alder is pale purplish brown, with dark purple ocellated spots, which, however, extend but a little way upon the fins; the eyebrows are tinged with dark green: the tentacles and head are speckled with large purple spots; the under surface of the arms is white. An example kept by us alive at Skye, when at rest in its own element and in the open air, became of an intense spotted red brown; the specks becoming smaller on the fins and arms, which were tinged somewhat with tawny. The eyebrows shone with golden-green reflections. When taken into a dark place it always became pale. The suckers and funnel were white. The most persistent portion of its colouring was that of the eyebrows. When swimming, and often when at rest, it flapped its fins rapidly, in the manner of a Pteropod.

Respecting this species, Mr. Alder writes us as follows from the Menai Straits:—"Miss Hughes has supplied me with three specimens of different sizes. This is an odd fish, crouching generally at the bottom like a toad, with its great goggle eyes half closed, and sometimes crawling along by means of its suckers, puffing the water through the funnel all the time. When it does take to swimming it darts very quickly through the water, and is difficult to catch. When taken out of the water and placed on the hand, it had recourse to an odd mode of progression, turning two or three summersets in regular tumbler-fashion; first laying hold with its arms, turning over, and laying hold again until it managed to get back into the water. In this species, too, the tentacular arms generally lie concealed within the others." Dr. Johnston remarks of it, "that although kept alive in a basin of sea water for about twelve hours, and repeatedly irritated, it never ejected any inky fluid, with which it is, nevertheless, amply provided."

It is probable, as has already been remarked, that the majority of British localities of *Sepiola* relate to this species. Whether Pennant's *Sepia sepiola* from the coast of Flintshire was it or not, it is impossible now to say. We have taken it in the Irish Sea; in fifteen, eighteen, and twenty fathoms, among the Hebrides, and in seven fathoms in the Sound of Skye. Mr. Alder has found it on the coast of Northumberland, and in the Menai Straits: also at Torbay. The week before our lamented friend, William Thompson, of Belfast, died, he submitted to our examination two specimens of *Sepiolæ* as possibly distinct. His sagacity did not deceive him in this, any more than in many other similar instances, for one of these little cuttle-fishes taken at Bangor in Ireland, in 1839, by Dr. Drummond, proved to be *S. Atlantica*, and the other was an Irish example of the true *Sepiola Rondeletii*. The statistics of the distribution of the two species have yet to be made out.

2. S. Rondeletii, Leach.

Suckers on the lower pairs of arms similar to those on the others.

Plate MMM. fig. 1.

Sepiola, Rondelet, 1554.
,, *Rondeleti*, Gesner, Aldrovandus, &c.
Sepia sepiola, Linn. ed. 12, vol. i. p. 1096.
Loligo ,, Lam. Mem. Soc. d'Hist. Nat. de Paris, p. 16. — An. sans Vert. vol. vii. p. 664.—Blainv. Dict. des Sc. Nat. vol. xxvii. p. 184. —Carus. Act. Acad. Nat. Cur. vol. xii. pt. 2, p. 318, pl. 29, f. 2, 3.—Philippi, Enum. Moll. Soc. vol. i. p. 241.—Gervais and Van Beneden, Bull. Acad. R. de Brux. vol. v. p. 428.
Sepiola Rondeletii, Leach, Nat. Misc. vol. iii. p. 138. — D'Orbig. and Férus. Ceph. Acet. p. 330, *Sepioles*, pl. 1, f. 1 to 6; pl. 2, f. 3, 4; pl. 3, f. 6-9.—D'Orbig. Moll. Viv. et Foss. p. 249, pl. 10, f. 13.—Verany, Moll. Med. vol. i. p. 56, pl. 22.

In all respects of form and proportions this species appears to agree with the last. Our British examples have a body apparently slightly shorter and more rounded; the arms are rather stouter at their bases; the lateral arms rather larger; the tentacular arms longer and with more slender peduncles; the suckers larger; and (a great and easily made-out difference) the terminal suckers of the lower arms gradually diminishing and alternating throughout. In spirits their bodies exhibit an uniform pink hue.

Verany describes Mediterranean examples as being of a delicate rose colour, dotted with spots of wine-red neutral tint. The middle of the body is marked by a large irregular blotch of bluish tint, indicating the position of the viscera within. Beneath, it is bluish dotted with pink. Around the eyes the head is tinged with blue and green.

At present we venture to cite only such British examples as belong to the *Rondeletii*, without a question. We have seen only two such specimens, one taken by Mr. Alder at Torbay, and a second in the collection of the late Mr. William Thompson, from Dundrum, county Down, in Ireland.

M. Bouchard-Chantereaux has observed respecting *Sepiolæ*, that they are most common in the English Channel on sandy coasts, and in time of hot weather. He says that they spawn towards the end of May and commencement of June, laying their spawn in the form of little bluish gelatinous masses in the centre of which the eggs are arranged, as if around an axis. Each mass contains from forty to a hundred and thirty eggs. Each female produces from fifteen to thirty-six of these, which are united at their bases by an amorphous gelatinous pedicle attached to submarine bodies. In from twenty-two to twenty-five days the young ones come out from the egg.

ROSSIA. Owen.

Body oval or rounded, short, truncated in front, rounded behind, not connected inferiorly with the head by a ligament, but quite free, furnished on each side by a suborbicular fin; locomotive apparatus formed of oblong crests, on the inner margin of the sleeve, and of margined sockets at the base of the funnel. Head large, eyes covered by an epidermic expansion, pierced by a very small hole. Arms ten, two of them tentacular and retractile. Pen corneous, flexible, small and sub-spatulate.

This genus was instituted by Professor Owen for a cuttle-fish, closely resembling a *Sepiola*, found in the Arctic Seas by Sir John Ross. There appear to be five described species, of which two are British, first made known by Dr. Robert Ball.

R. MACROSOMA, Delle Chiaje.

Suckers on the arms small, numerous, nearly equal.

Plate MMM, fig. 1.

Sepiola macrosoma, DELLE CHIAJE, Mem. t. lxx. *Anim. invert.*, vol. i. pl. 11, f. 11. — PHILIPPI, Enum. Moll. Sic. vol. i. p. 203. — GERVAIS and VAN BENEDEN, Bull. de l'Acad. de Brux. vol. vi. No. 1.

Rossia „ D'ORBIGNY and FERUSSAC, Ceph. Acet. p. 245. *Sepiola*, pl. 4. f. 13—24.—D'ORBIGNY, Moll. Viv. et Foss. vol. i. p. 257. pl. 11.—VERANY. Moll. Med. vol i. p. 60. pl. 23. fig. *a. b.*

„ *Jacobii*, BALL, Proc. Royal Irish Acad. vol. ii. p. 193.—THOMPSON, Rep. Brit. Assoc. 1843, p. 248.

This cuttle-fish was first met with on our coasts by Dr. Jacob, of Dublin, who obtained it from Dublin Bay, and communicated in to Dr. Ball.

Its body is large, smooth, and broadly bell-shaped, with latero-dorsal suborbicular fins, having broad bases of attachment. The head is broad and short; with prominent eyes. The arms are rather short in proportion, linear-lanceolate. They are strongly webbed together at their bases, with the exception of the lower pair. Dr. Ball remarks that "the membrane round the mouth forms an hexagonal figure, from each angle of which a ridge runs, which is decurrent in six cases; on the second, third, and fourth pair of arms, and in the seventh, the ridge passes upon the web between the first pair of arms, where it bifurcates and runs out on the side." The suckers are small, oblique, white, and pedunculate; they are ranked in double file on the lower part of the under surfaces of the arms, and in fours regularly and irregularly throughout the remainder. The suckers are nearly equal in size on all the arms. The tentacles are very long and slender in proportion to the body. Their extremities are lanceolate, crested above, and bear on their under surface, very numerous rows of minute suckers.

The dimensions of the specimen taken by Dr. Jacob are in inches; length of the body, 2·1; breadth over fins, 2·7; length of head, 0·7; length of tentacula, 5·7; length of third and longest pair of arms, 2·6; length of first and shortest pair, 2·2.

Besides the Dublin Bay locality, Mr. William Thompson procured this pretty species from the coast of the north of Ireland, and in a specimen submitted to us for examination, we could find no characters by which to distinguish it from the Mediterranean *macrosoma*.

The colour of that animal is described by Verany as being of a general wine-rose hue, clouded with bluish and yellowish tints, on its upper surface, and livid rose on its under. The eyes are strongly tinted with blue, and shine with very vivid green and silver reflections. Above it is marked with irregular red specks, which are more scattered below, and there are few or none on the edges of the fins and funnel. The ink is black. The pen is linear, lanceolate, and slightly spatulate in its lower half.

R. OWENII, Ball.

Suckers in the arms large, pearl-like, unequal.

Plate SSS, fig. 1.

Rossia Owenii, BALL, Proc. Royal Irish Acad. vol. ii. p. 193.—THOMPSON, Rep. Brit. Assoc. 1843, p. 248.—D'ORBIGNY, Moll. Viv. et Foss. vol. i. p. 259.—LOVÉN, Index Moll. Scand. p. 3.

This fine and rare species was first obtained by Dr. Ball, in 1839, from a fisherman who had found it in a

Dublin Bay fishing-boat. It was named by its discoverer after Professor Owen. Mr. Saxby, of Bonchurch, in the Isle of Wight, had the good fortune to add it to the English fauna. He took a fine specimen near his house in 1849. We are not acquainted with any other instances of its capture. Professor Lovén records it as an inhabitant of the west coast of Sweden.

Its body is rather shortly campanulate. The fins are roundish, with broad bases of attachment, and are fixed well up on the sides of the back. The head is large and short, with large bulging eye-protuberances. The arms are unequal, narrowly lanceolate, all except the two lower ones connected together at their bases by a short web. The disk around the mouth is very free from suckers. The tentacles are long and stout, much exceeding the body, and terminated in compressed, crested, lanceolate tips, bearing on their under surface numerous very small suckers, closely set and ranked in as many as six in a row. The suckers on the ordinary arms are large, globular, pedunculate, and have oblique, almost lateral cups. They are ranked in oblique rows of three or four, the two inner ones smaller than those that flank them. Near the bases of the arms the lateral suckers only are seen. The suckers on the two upper arms are more nearly of a size among themselves, more numerous, and smaller than those on the others. The colour of a specimen in spirits is dull purplish on the back with numerous minute purple specks, which are seen also on the under side, head, and upper surface of arms.

Dr. Ball writes to us respecting this animal,—"I had for some hours a specimen of *Rossia Jacobi* alive. It was very active and watchful. On passing the hand between it and the light, the changes of colour were as quick as thought.

When lying quietly at the bottom of the basin it was sometimes almost white, but on passing my hand over it, became instantly of a bright liver red, or rather apothecary rose colour. It displayed various degrees of this colour, occasionally variegated with blotches of white. Its variations of tint were rapid beyond comparison with the chameleon's. I observed that a narrow silvery line ran down each side, somewhat similar to that on the side of a sand-smelt, but of rather milder lustre. After death these stripes disappeared."

Dr. Ball's specimen (kindly transmitted to us for examination) measures 1·7 inch in length of body; 0·5 inch, length of head; and four inches, length of tentacles. A detailed measurement of it is published with the original notice of the species. That of which notes and a drawing were obligingly communicated by Mr. Saxby measured in inches, 5·75, total length; the head, 1·4; the longest arm, 2·5; the body, 2·0; the breadth of the body, 1·9. This is assuredly a rare animal.

LOLIGO. Lamarck.

Body fleshy, firm, cylindrical, elongated, towards its posterior extremity flanked by two triangular fins, which run to the tail. Locomotive apparatus formed of two oblong margined pits placed at the base of the funnel, and of corresponding linear prominent crests on the inner margin of the sleeve. Eyes covered by an epidermic expansion, pierced with a small opening; no lacrymal sinus. Arms ten, two of them tentacular, imperfectly webbed. Pen corneous, flexible, lanceolate, as long as the body, terminating in an obtuse point.

The cuttle-fishes of this genus and the next are known popularly by the name of squids. Their spawn is enveloped in oblong gelatinous tubes, numbers of which are found adhering to a common mass by their lower extremities.

L. vulgaris, Lamarck.

Fins flanking two-thirds of the body, and forming an oblong rhomb.

Plate LLL.

Sepia loligo, Linnæus, Syst. Nat. Ed. 12, vol. i. p. 1096.—Pennant, Brit. Zool. vol. iv. p. 53, pl. 27.—Bosc. Vers. p. 46.

Loligo vulgaris, Lamarck, Mem. Soc. d'Hist. Nat. de Paris, p. 11.—An. sans Vert. vol. vii. p. 667.—Blainville, Dict. des Sc. Nat. vol. xxvii. p. 143.—Carus. Nov. Act. Acad. Nat. Cur. vol. xii. p. 319, pl. 31.—Feruss. and D'Orbigny, Tab. des Ceph. p. 63. —Ceph. Acet. Calmars. pl. 8, 9, 10, 22, (figs. 13 and 23) (fig. 1—12).—Risso. Hist. Nat. Eur. Mer. vol. iv. p. 6.—Fleming, Brit. An. p. 252.—Blainville, Faun. Franc. pl. 3, fig. O, p. 15.— Philippi, Enum. Moll. Sic. vol. 1, p. 241.— D'Orbigny, Moll. Can. p. 23. — Moll. Viv. et Foss. vol. i. p. 336, pl. 18, fig. 1—12 and 19, fig. 2—4.—Johnston, Berw. Club Trans. i. p. 198.—Macgillivray, Moll. Aber. p. 29.—Verany, Moll. Med. vol. i. p. 89, pl. 34.

The body of this handsome animal is cylindrical anteriorly, tapering and gradually contracted from some distance in front of the middle to the caudal extremity. For nearly two-thirds of its length, it is flanked by subtriangular fins, giving an irregular rhomboidal contour to the hinder portion. The angles of the fins are obtuse. These organs extend quite to the tail, and join there. The head is short and broad, not over prominent in the region of the eyes. The eight ordinary arms are stout and rather short, somewhat lanceolate, or linear lanceolate in shape, slightly webbed together at their bases. On their inner sides they are furnished with two rows of oblique suckers with eccentric openings, of which the horny hoops are armed on their broader side with teeth. The tentacular arms are long, stoutly pedunculated and furnished at their lanceolate extremities with suckers, large centrally, small towards their tips, and ranked in fours. The general hue of the animal is bluish, with purplish specklings, which are numerous, and areolated in the centre of the back, and are close set, and dark on the head and hinder portions of the tentacula. Beneath it is yellowish white. The pen is lanceolate; that of the female is said to be broader and more obtuse than that of the male. The jaws are brown with white tips. The body grows to a length of nearly a foot and a half; the head and arms add about half a foot to the total length.

Dr. Johnston remarks that " it makes an excellent bait for cod, but does not occur in sufficient numbers to be used by our fishermen. The ink is jet black. I have found the beaks of a small individual in the stomach of a large one, so that it certainly feeds occasionally on its own race."

It appears to be generally distributed around the British Islands, though met with only occasionally. Among the earlier figures of native specimens is one by Borlase of an example taken on the coast of Cornwall. It is specially recorded from the Northumbrian coast (Alder); Berwick bay (Johnston); Frith of Forth (Grant, E. F.); Aberdeen (Macgillivray); Isle of Man (E. F.); north and east of Ireland (W. Thompson).

Verany remarks, that, in consequence of communications made to him by Ferussac, it would appear that the *L. vulgaris* of the Mediterranean is not identical with the Atlantic species; the latter is paler and the disproportion of the suckers upon the club (which is smaller) of its tentacula is much less. A comparison of the figure we have given, from an excellent drawing communicated by Mr. Alder, with the admirable representation in Verany's work, will show that there is really reason to believe in the likelihood of two species being confounded under one name. It is possible that both inhabit our seas, since Pennant's figure agrees better with Verany's than with ours.

L. MEDIA, Linnæus.

Body elongated, subulate, produced and acuminated posteriorly, fins narrow and rounded.

Plate QQQ, fig. 1.

Sepia media, LINNÆUS, Syst. Nat. Ed. xii. vol. i. p. 1095.—PENNANT, Brit. Zool. iv. p. 54, pl. 29, fig. 45.—BRUGUIERE, Enc. Méth. pl. 76, f. 9.
„ *subulata*, Bosc. Vers. p. 46.
Loligo „ LAMARCK, Mem. Soc. d'Hist. Nat. Paris, i. p. 15.—BLAINVILLE, Dict. Sc. Nat. t. xxvii. p. 143.—FERUSSAC and D'ORBIGNY, Tab. des Ceph. p. 63.—D'ORBIGNY, Ceph. Acet. Calmars, pl. 17, 23, fig. 19, 13—21.—BALL, Pro. Royal Irish Acad. vol. ii. p. 192.—THOMPSON, Rep. Brit. Assoc. for 1844, p. 248.
„ *media*, FLEMING, Brit. An. p. 253.—ALDER, Cat. Moll. Northumb. p. 15.
„ *parva*, LEACH, Zool. Misc. v. iii. p. 141.—D'ORBIGNY, Moll. Rec. et Foss. vol. i. p. 338.

This cuttle-fish is commonly supposed to be the lesser calamary, or *τευθις* of Aristotle; an opinion which we have combated elsewhere.* It, or the next, was long ago observed, however, by Rondeletius. It is a much elongated animal, subcylindrical anteriorly, diminishing gradually posteriorly, and much prolonged and pointed at the tail. In specimens preserved in spirits, its extremity is singularly sharp and produced. The neck margin of the back is prolonged into a sort of obtuse lobe. The fins are widely apart above, long, somewhat rounded, broad anteriorly, tapering and converging behind, and becoming decurrent on the tail. In consequence of their outline, their combined contour is heart-shaped above. The head is short, very prominent in the region of the eyes, and is crowned with rather short lanceolate, very unequal arms, provided with double rows of suckers. These arms are very much squared at their edges. The tentacular arms are short in proportion to the length of the body; on their lanceolate extremities there are two rows of large suckers, and two rows of smaller ones outside. The mouth is surrounded by an angulated membrane. Specimens in our possession measure five inches and a half in length, more than half the entire length of the animal being in front of the upper union of the fins with the body. It is a transparent and glassy creature, when alive, speckled with dots of red or purple. The pen is lanceolate, narrowing above.

---

* Travels in Lycia, vol. ii.

Mr. Alder has lately obtained several specimens from the Menai Straits (whence our examples had been dredged by Mr. M'Andrew), and through the kindness of Miss Hughes was enabled to observe them in fine condition when alive. He informs us that "they are very lively and active animals, swimming forwards and backwards at pleasure, the latter by means of the funnel, the former by the fins. They seldom or never show their tentacular arms when swimming, but when they rest in an inverted position, adhering by their suckers, they throw out their tentacles as additional anchors." Specimens three inches in length, looked when alive not unlike a large shrimp.

Besides the locality abovementioned, where they appear to be not uncommon, this pretty squid is taken on the coast of Northumberland, but rarely, and has recently been caught at Peterhead, on the east coast of Scotland, by Mr. Peach. Dr. Ball and Mr. W. Thompson have taken it in both the north and south of Ireland.

L. MARMORÆ, Verany.

Body shorter and stouter than in *subulata;* tentacular arms longer; tail not much produced.

Plate QQQ, fig. 2.

Loligo marmoræ, VERANY, Moll. Med. vol. i. pl. 37.
„ *media* (pars) AUCTORUM.

In the valuable lists of Irish cuttle-fishes published first by Dr. Ball, and afterwards by Mr. W. Thompson, a distinction is indicated between *Loligo media* and *Loligo subulata.* By the latter an elongated and much acuminated form is intended; by the former a shorter and stouter animal, an individual of which, preserved in spirits, and taken off Youghall, has been kindly forwarded for our examination by Dr. Ball.

This specimen agrees so well with the figures and description of *Loligo marmoræ*, given by Verany, that we do not hesitate to refer it to that species. In most respects it closely resembles *L. subulata.* The body, however, is stout and rather broad, and the lateral fins are not only recurrent upon the tail, but appear to meet at its extremity. The arms are short and stout; and provided with two regular rows of suckers; the tentacular arms are borne on long peduncles, which can reach to a level with the middle part of the fins. The length of the body and ordinary arms, taken together, is about four inches. The skin appears to have been strongly dotted with purple or red.

M. Alcide d'Orbigny maintains that the *Loligo marmoræ* is only the female of *Loligo media.* It is to be hoped that, having directed attention to their differences, those British naturalists who may have an opportunity of inquiring into their relations, will settle the doubt.

OMMASTREPHES. D'ORBIGNY.

Body fleshy, firm, cylindrical, elongated, flanked near its posterior extremity by two triangular fins. Locomotive apparatus formed of "conical perpendicular pits, each communicating by a narrowed groove with a small horizontal pit, surrounded by a prominent margin, the whole describing a rather prominent triangle, placed at the base of the locomotive tube; and, besides, of a tubercle prolonged in its upper part into a decreasing nose-shaped crest; and, lastly, of little horizontal inferior crests placed on the inner margin of the body." Eyes very large, opening widely exteriorly, and provided with a lacrymal sinus. Arms ten, like those of *Loligo*. Pen corneous, flexible, elongated, as long as the body, terminating at its lower extremity in a hollow simple cup.

The cuttle-fishes of this genus closely resemble those belonging to *Loligo*. Besides the character just given they may generally be distinguished by the short rhomboidal termination of the body formed by the fins combined with the hinder extremity.

The species are mostly pelagic, and some of them are gregarious. They seem to be distributed all over the world. They are called flying squids by fishermen.

O. SAGITTATUS, Lamarck.

Body elongated; peduncles of tentacular arms free from suckers; extremities of their clubs covered with closely-set rows of numerous minute suckers.

Plate RRR, fig. 1.

Sepia loligo, LINNÆUS, Syst. Nat. Ed. xii. vol. i. p. 1095.—BRUGUIERE, Enc. Méth. pl. 77, f. 12.

Loligo sagittata, var. B. LAMARCK, Mem. Soc. Hist. Nat. de Paris, p. 13.—Anim. sans Vert. v. vii. p. 685.—VERANY, Moll. Med. vol. i. p. 107, pl. 31 and 32.

„ *Brogniartii*, BLAINVILLE, Dict. Sc. Nat. xxvii. p. 142.—FERUSS. and D'ORBIGNY, Ceph. Acet. Calmars. pl. 4.

Ommastrephes sagittatus, D'ORBIGNY, Ceph. Acet. p. 345.—*Idem*, Moll. Rec. et Foss. vol. i. p. 418, pl. 29, f. 12, 16.

At the moment when we had almost given up hope of proving this often-recorded cuttle-fish to be British, or at least an English species, since it seemed probable that in most instances *O. todarus* had been mistaken for it, the Marchioness of Hastings, whose zeal in the cause of natural history and indefatigable palæontological researches has rendered many services to natural history, kindly forwarded to us a cuttle-fish which had been taken at Brighton: it proved to be the true *Ommastrephes sagittatus*. Not long afterwards, a second individual was taken by our friend Mr. Mackie, Collector of Folkstone, and, also, sent to us for examination.

The first of these was the smaller specimen; it measured seven inches and a half in length of body, one inch in length of head, five inches in length of longest arm, and seven inches in length of tentacles. The fins were four inches in length, large in proportion to the body, indicative of its being a female, and their greatest breadth was five and a half inches. Its colour was of a beautiful pearly grey, blushed with red and bronze, and speckled on the dorsal aspects of body, head and tentacles with numerous purple and yellow dots, which became few and scattered beneath.

The body in this species is elongated and cylindrical, and in male individuals the finned portion occupies only two-thirds of its length. Below the upper junction of the fins it suddenly contracts and tapers to an obtuse extremity. The fins form, with that part of the body to which they are attached, a nearly regular rhomb. The head is broad and thick, not very prominent in the region of the eyes; the arms are stout and tapering. The superior pair are shortest; the lateral pairs longest. The suckers on the latter are larger than those on the upper and lower pairs. On all they are arranged in two rows, gradually diminishing in size to the tips. The arms are slightly webbed together at their bases, and the inferior lateral ones are crested on their outsides. The tentacles are stoutly pedunculated, terete, and terminate in narrow lanceolate clubs. There are no suckers on their peduncular portions. On the uppermost portion of the clubs the suckers are small, and two-ranked on the central portions; besides two outer rows of small suckers, there are two inner or middle rows of very large ones; these suddenly cease at some distance from their tapering tips, which are covered with very minute closely-ranked suckers, as many as eight in a row at their commencement. The funnel is broad-based and bilobed below, with auriculated lobes. The pen is long, narrow, and three-sided.

Mr. D'Orbigny regards the *Loligo piscatorum*, *harpago*, *illecebrosa*, and *Coindetii*, as all founded on this species.

O. TODARUS, Delle Chiaje.

Body elongated; peduncles of tentacula provided with suckers throughout their length.

Plate RRR, fig. 2.

Loligo sagittata, var. A. LAMARCK, Mem. Soc. d'Hist. Nat. de Paris, p. 13.—An. sans Vert. t. vii. p. 663.—CARUS. Mem. Acad. Nat. Cur. t. vii. p. 318, pl. 30.—FERUSSAC and D'ORBIGNY, Ceph. Acet. plates, Calmars, pl. 1—FLEMING, Brit. Anim. p. 253?—JOHNSTON, Berw. Club. Trans. vol. i. p. 199.—BALL, Proc. Roy. Irish Acad. vol. ii. p. 192 (in part).—THOMPSON, Brit.

Assoc. Rep. 1844, p. 248.—ALDER, Moll. North. p. 15.

Loligo todarus, DELLE CHIAJE, Anim. Invert.—VERANY, Moll. Med. vol. i. p. 101, pl. 33.

Ommastrephes „ D'ORBIGNY, Ceph. Acet. text, p. 349. — Moll. Viv. et Foss. vol. i. p. 423, pl. 29, fig. 3—11 and 30, fig. 5—6.—HANCOCK, Annals Nat. Hist. 2nd ser. vol. x. p. 1.

This is the squid which is usually recorded in British catalogues, under the name of *Loligo sagittata.* We owe to Mr. Alder and Mr. Hancock, the recognition of its true specific relations. Its body is elongated and cylindrical, tapering below to an obtuse extremity, flanked in its lower third by two triangular fins inserted well in upon its back, and forming together a rhomboidal outline. Head broad and short, not very prominent in the region of the eyes, crowned with eight stout subulate arms, of which the two lateral pairs are longest, and the inferior lateral crested dorsally. The suckers are large and arranged in two rows on each arm. Tentacular arms with stout peduncles, along the whole of the upper surfaces of which are suckers ranged in two rows; on the long lanceolate clubs the suckers become larger, and alternate with smaller external ones; at the extremity of the club they continue in two ranks, but become very small. The back of the club is crested. There are suckers on the lips surrounding the beaks. The funnel is strong and large. The pen is linear, three-ribbed, broadest at its superior extremity, and ends in a spatulate expansion and a small conical cup.

The following are the dimensions of an example, measured by Mr. Alder in February, 1851:—Length (not including arms), one foot, two inches and a-half; length of body, one foot; of head, two inches and a-half; longest arm, eight inches; shortest arm, six inches; tentacular arms, one foot, one inch; length of fin, six inches; breadth of fin, seven inches and a quarter; breadth of body, three inches and a-half; diameter of largest ring of a tentacle, three-tenths of an inch; length of pen, eleven inches and three-quarters; its breadth half an inch.

Dr. Johnston observes of this species, that its ink is of a blackish brown colour, or dark olive green. He found the stomach of a large specimen filled with fragments of *Alaria esculenta*, on which the creature had been feeding when taken, for pieces of this weed were found between the beak, half swallowed. Verany states, that its flesh is bitter, leathery, and unwholesome.

It is difficult to ascertain exactly whether any other than this species is commonly called *sagittata* in local lists. It would appear, however, to be distributed around the three kingdoms. Mr. Alder has determined its presence on the coast of Northumberland; Dr. Johnston at Berwick-on-Tweed; we have taken it in the Frith of Forth (E. F.); and an Irish example, from Youghall, taken by Dr. Ball, who states that this form is most common, is unquestionably *todarus*, but varies in having shorter tentacles than usual. It has been made the subject of an elaborate memoir, on the anatomy of its nervous system, by Mr. Albany Hancock.

O. Eblanæ, Ball.

Body proportionately short; suckers confined to the clubs of the tentacles, minute and four-ranked at their extremities.

Plate SSS. fig. 2.

Loligo Eblanæ, Ball, Proc. Royal Irish Acad. vol. i. p. 463.—Thompson, Rep. Brit. Assoc. for 1844, p. 248. — D'Orbigny, Moll. Viv. et Foss. vol. i. p. 353.

This remarkable species was first found by Mr. Warren, in Dublin bay, in 1836, and afterwards in the same locality by Dr. Ball, and in Belfast bay by Mr. Thompson. It was described under the above name by Dr. Ball, who called attention, also, to the characters which enable us to assign to it its true generic position.

Its body is very short as compared with other species of the genus, and is somewhat urn-shaped. The fins occupy about three-sevenths of its length; they are widely triangular, and exhibit in their conjunction, an elliptical contour. The head is short, broad, and somewhat depressed above. The arms are rather slender and tapering; the two lateral pairs longest. They bear remarkably large pedunculate suckers, two-ranked and set well apart. The inferior laterals are crested externally. The tentacular arms are very stout, but have their peduncles quite bare; they are long, and extend below the tail; their clubs are furnished centrally with two rows of few and very large suckers, flanked by a few alternating small ones; their extremities are compressed, crested above, and bear below two or three rows of minute suckers on long peduncles.

The length of the original specimen is ten inches, including arms and tentacles. The body is 3·1 inches in length; the head 1·6; the longest arm three inches; the tentacles six inches. The fin is 1·3 inches in length, and three inches in breadth. The pen is narrow, three-ribbed, and is spatulate at the extremity.

SEPIADÆ.

The animal of the only genus of this family, of which existing species are known, is a Decapod, having a broad body, surrounded by a pair of narrow fins of nearly equal dimensions throughout. The characteristic distinction of the group lies in the shell, or cuttle-bone, which is a calcareous plate terminating in a more or less distinctly chambered extremity. There are several fossil genera belonging to the *Sepiadæ*, all, however, of tertiary age, though species of the typical genus, *Sepia*, date far back, even to the oolitic epoch.

SEPIA. Linnæus.

Body oval, often very broad, compressed and depressed, margined throughout its circumference by two narrow fins. Locomotive apparatus formed of an oblong, conical crest, bordered above by a deep circular furrow, and placed on the inner wall of the sleeve, and of an oblong, deep, marginated furrow at the lower part of the funnel. Head flattened, eyes covered by an epidermic expansion, pierced with a small hole. Arms, ten, two of them tentacular, in great part webbed together.

Internal shell lodged dorsally, as long as the body, solid, depressed, more or less oval, rounded and thin anteriorly, bordered behind and often rostrated at the extremity; rugose above, bordered by a horny margin.

S. OFFICINALIS, Linnæus.

Animal with zebra-like markings on the back. Bone ovate.

Plate OOO, and Plate PPP, fig. 1.

Sepia officinalis, LINNÆUS, Fauna Suecia, p. 2106.—Syst. Nat. Ed. xii. vol. i. p. 1095.—PENNANT, Brit. Zool. vol. iv. p. 55.—BRUGUIERE, Enc. Méth. pl. 76, f. 56.—Bosc. Vers. i. p. 45.—LEACH, Nat. Misc. t. iii. p. 138.—LAMARCK, Anim. sans Vert. t. vii. p. 668.—CARUS, Nov. Act. Nat. Cur. t. xii. p. 317, pl. 38.—RISSO, Hist. Nat. Eur. Mer. t. iv. p. 3.—BLAINVILLE, Dict. Sc. Nat. t. 48.—FLEMING, Brit. An. p. 252.—POTIEZ and MICHAUD, Gall. des Moll. de Douai, t. i. p. 8.—PHILIPPI, Enum. Moll. Sicil. vol. i. p. 241.—FORBES, Malac. Mon. p. i.—D'ORBIGNY, Moll. de Canaries, p. 20.—Moll. Rec. et Foss. vol. i. p. 272.—D'ORBIGNY and FERUSSAC, Ceph. Acet. p. 260. Seiches: plates 1, 2, 3 (fig. 1—3), and 17 (fig. 12).—MACGILLIVRAY, Moll. Ab. p. 29.—BALL, Proc. Royal Irish Acad. vol. ii. p. 192.—LOVÉN, Index Moll. Scand. p. 3.—JOHNSTON, Berw. Club Tran. vol. i. p. 200.—VERANY, Moll. Med. vol. i. p. 65, pl. 24, 25.—ALDER, Cat. Mol. North. p. 15.

The common cuttle-fish is one of the most beautiful and curious of British mollusks; but although its bone, or shell, is frequently cast up on all our sandy shores, the creature itself is rarely seen and seldom taken. Its body is depressed and broad, rounded posteriorly, and truncated, although centrally produced, anteriorly; its outline is that of an escutcheon. All around the margin run narrow and delicate fins, one on each side, of equal breadth, except at the extremity, where they meet and present, as it were, a notched termination to the body. The back is smooth, or slightly tuberculated. The head is much narrower than the body, although in itself broad, prominent in the region of the eyes, and crowned above with eight rather short, stout, lanceolate, subcarinated arms. On their inner sides are four rows of equal and regular, but rather small suckers, which are globular and stalked, and have simple hoops. The margins of the arms are fringed by a membrane, and the fourth pair is crested. The tentacular arms are very long, borne upon stout, smooth peduncles, terminating in clubs, crested dorsally, and bearing on their flat surface, which is expanded at the sides into a plaited flounce, several rows of unequal suckers, of which the central are large and few, and terminal ones numerous and minute. The buccal membrane is attached to the arms by web-like processes.

The colours of this animal resemble the pattern of a zebra's hide. Centrally the back is marked by numerous fine interrupted irregular bands of white on a dark brown ground; laterally with broad white stripes, many of which, usually alternate ones, bifurcate at each end, the interspaces being rich vandyke-brown; between them and the lateral fin the skin is tinged with tawny, and irregularly spotted. The fins themselves are brownish above, minutely speckled with white; a white line runs parallel with the edge, which is itself bounded by a minutely speckled very narrow border. The neck is white, with greenish and rosy reflections. The back of the head and arms is rich brown, becoming faint and passing into specks on the sides of the latter. The eyes are black. The tentacular arms are white, with a few pinkish-brown dots. The entire under surface is bluish-white, with rosy specks. No figure that we have seen gives a true idea of the rich painting of the common cuttle-fish.

The female is wider than the male.

The "bone," or shell, is thick, but depressed, ovate-oblong, varying a little in shape in different examples, very regular and symmetrical, slightly convex above, where it is smooth and corneous at the sides, more or less sulcated and rugose, in the greater part, centrally, the sulci describing semicircles, from the mucro upwards, and becoming broken into rugosities laterally. Along the centre there is a broad depressed, rounded longitudinal ridge, separated from the sides by shallow, slightly-marked, and broad furrows, or rather depressions. Near the posterior extremity is seen the hard mucro. It is most prominent in young specimens. The under surface is convex before, depressed and hollowed out at the sides behind; the former portions smooth, the latter transversely striated. The margin widely projects below and curves upwards and inwards, and inferiorly expands. wing-like, around the nucleus of the shell. The substance of the "cuttle-bone" is composed of numerous testaceous laminæ, separated from each other by a perpendicularly fibrous calcified tissue, exhibiting a shining white and satiny lustre, and having a pumiceous aspect and feel. Thus, extreme lightness, in proportion to its bulk, is given to this body.

The bone (often used for pounce), equals in length the body, without the fins. A fine cuttle-fish, now before us, taken by Mr. Mackie off Folkstone, measures nine inches and a-half in length of body, to which one inch is added as the breadth of the fins. The breadth of the body is six inches. The head is three inches long and four inches broad at the eyes. The arms are five inches in length, and the tentacles a foot and a-half long.

This animal seems to be generally distributed around the shores of Britain. It is scarce to the north of our islands, more common to the south, and exceedingly abundant in the Mediterranean. Its eggs are dark oval, with prominent summits, and have a membranous ring at their bases, by which they are attached to sea-weed, or fixed to each other so as to form masses of considerable numbers.

S. BISSERIALIS, De Montfort.

Animal pale above, clouded with red; bone elliptical, lanceolate, tinged with red.

Plate PPP, fig. 2.

Sepia bisserialis, DENIS DE MONTFORT (*fide* VERANY).—VERANY, Moll. Med. vol. i. p. 75, pl. 26.
,, *elegans*, FERUSSAC and D'ORBIGNY, Hist. Ceph. Acet. p. 280. Seiches pl. 8, fig. 1—5, and 27, fig. 3—6.—D'ORBIGNY, Moll. Viv. et Foss. p. 285, pl. 12, f. 6, 8.
,, *rupellaria*, FERUSSAC and D'ORBIGNY, Hist. Ceph. Acĕt. p. 274, Seiches, pl. 3, f. 10—13.—BALL, Proc. Royal Irish Acad. vol. ii. p. 192.
,, *rubens*, PHILIPPI, En. Moll. Sicil. vol. i. p. 203.
,, *Orbignyana*, FERUSSAC, Hist. Ceph. Acet. Seiches, p. 273, pt. 5, pl. 27, f. 1—2?—D'ORBIGNY, Moll. Viv. et Foss. p. 275, pl. 3—4?

Of this very distinct cuttle-fish, the bones only have as yet been met with in the British seas, three specimens having been found at Magilligan, in the North of Ireland, by Mr. Hyndman, and one on the Northumberland coast, by Mr. Alder. They are of an ovate lanceolate shape, narrowed below, in detail of parts resembling the common cuttle-bone, but strikingly different in outline. The British specimens vary somewhat in width. They are tinged with delicate rose-colour. Mr. Alder has compared his with specimens of the true *bisserialis* bone received from Verany, and finds an agreement in every essential particular. He remarks, that "the foreign examples are a little smaller, and rather narrower, but the largest of them approaches very nearly to my specimen, much more so than Verany's figure." The *Sepia rupellaria* of Férussac was founded on a bone taken on the Atlantic coast of France, and appears to be only this species deprived of its lateral membrane. *Sepia Orbignyana* is surely one of the sexes of the same.

Verany, however, considers it as the *Sepia elegans* of De Blainville, and as distinct.

It is to be hoped that this pretty cuttle-fish will be found alive before long in our seas. It may easily be distinguished by its narrower body, the great difference of colouring, and the short club-like terminations of its tentacular arms. It is a much smaller animal than the last. The largest British example of its shell hitherto taken, measures two and a half inches in length, by ten-twelfths of an inch in its widest part.

SPIRULA PERONII, Lamarck.

Nautilus spirula (of Linnæus), TURT. Conch. Diction. p. 117, f. 77.
Spirula Australis, FLEMING, Brit. Animals, p. 227.—THOMPSON, Ann. Nat. Hist. vol. v. p. 10.—COUCH, Cornish Fauna, pt. 2, p. 67.
" *Peronii*, Brit. Marine Conch. p. 227.

As Professor Owen considers that the animals of the shells usually classed together as the *Nautilus spirula* of the Linnæan school, constitute three distinct species (*Peronii*, *reticulata*, and *Australis*), we have not ventured to cite any foreign synonyms, since the known shells of this genus cannot (at least by ourselves) be distinguished from each other, and the cephalopod has not hitherto been taken in the British seas.

In regard to indigenousness, "the claims of the present species," observed Dr. Fleming, "are doubtful. It is probable that the remains of many other animals, the ordinary inhabitants of the West Indian seas, will occasionally occur on the Irish coast, as in the present instance; but we have to determine their capability of *living* in our seas before their right to a place in our Fauna can be established."

Shell loosely spiral, thin, semi-transparent, dull white, smooth to the eye, except where the walls of the internal chambers are indicated by annular depressed lines, which towards the apex so pinch the primary coil as to give the appearance of strung beads or globules to the earlier-formed portion. Surface beneath the microscope minutely and closely pitted. Whorls cylindrical, tapering with tolerable quickness: the last one nearly straight at its termination. Aperture circular, of a silvery nacre, chambers very numerous, divided from each other by a vaulted plate, but connected throughout by a narrow tube, which runs along the inner side of the gyration. Diameter almost an inch; at the mouth nearly three lines.

"Two specimens of this interesting addition to our native stock, were found on the strand between Kenmare harbour and Ballyskellig's bay, in the county of Kerry, Ireland, by our intelligent and much respected friend, Mr. O'Kelly, of Dublin, in the summer of 1817, where, as he observes, the waves of the Atlantic come unbroken from the shores of America." (Turton Conch. Dict.) It "is mentioned in the late Mr. Templeton's MSS., as having been obtained near Whitehouse, Belfast bay; and at Portrush, near the Giant's Causeway, by Mrs. Clemnow. Mr. R. Ball has procured it near Youghall,* as Mr. W. H. Harvey once did on the coast of Clare." (Thompson). Mr. Couch remarks, "that three specimens have come into his possession," out of several which had been taken, as he was informed, on the coast of Cornwall.

---

* But only entangled among some *Cirrhipedes* attached to the mast of a vessel (Thompson, Report Invert. Ireland).

APPENDIX.

During the course of publication of these volumes many new facts respecting the shells and animals therein described have been brought to light, in a great measure owing to the attention directed to them in consequence of the indications of *desiderata* mentioned in the preceding pages. Many new localities have also been recorded, and a few new species discovered. The great length to which our work has extended will not warrant our entering upon not a few of the controversial questions that have arisen out of the vigour with which the study of the British Mollusca has recently been pursued, and compels us to confine the matter of this Appendix to descriptive notices necessary for the completion of our History.

TUNICATA.

SYNTETHYS. Forbes and Goodsir.

(Family Clavelinidæ.)

Common mass sessile, gelatinous, forming a single orbicular system. Individuals very prominent, arranged subconcentrically. Branchial and anal orifices simple, and not cut into rays.

Thorax oblong and cylindrical: branchial chamber with thirteen transverse rows of oblong openings, fringed and ciliated; hooked fleshy tubercles at the intersections of the branchial meshes. Œsophagus elongated, situated on the left side. Stomach cubical, spongy or glandular. Intestinal loop large and open, reaching to the bottom of the muscular tunic; its ascending portion glandular, probably hepatic; the rectum passes from the ventral to the right side of the œsophagus; the anus is on the dorsal edge of the sac about the middle. The ovary is in the loop of the intestine, but was not in season in the specimens taken. Testis white, ramifying on the surface of the ovary; the vas deferens runs up on the œsophagus and rectum to the side of the anus. The heart is in the loop of the intestine and ovary.

Sp. SYNTETHYS HEBRIDICUS.—All the specimens were dredged in thirty fathoms water, close to Croulin Island, near Applecross. The locality in which they occurred is remarkable for the assemblage of boreal mollusca there congregated, so that we may reasonably expect that this extraordinary Ascidian will be found hereafter in the Norwegian Seas. It is probably a member of the boreal type of the British fauna. It was discovered by Mr. M'Andrew. A detailed account and figures of it are contained in the "Transactions of the Royal Society of Edinburgh" for 1851.

The genus *Syntethys* is intermediate between *Diazona* and *Clavelina*. The only known species forms compact greenish translucent gelatinous masses of half a foot in diameter, and nearly equal height, affixed to rocks or stones by a short base. The individual Ascidians are, when full grown, two inches in length. Their inner tunics are remarkably irritable, withdrawing themselves into the common mass when pinched.

Mr. Couch, some years ago, laid before the British Association at Plymouth, gelatinous masses very similar to the *Syntethys* from deep water off the coast of Cornwall. These have proved to be compound *Ascidians*, and are now under examination by Mr. Huxley, who has undertaken the investigation of this curious group of Mollusks.

APPENDICULARIA. CHAMISSO.

When cruising off the north coast of Scotland in 1845, with our friend, Mr. M'Andrew, we were attracted by the appearance of cloudy patches of red colouring matter in the water, and on procuring some we found, on submitting it to microscopic observation, that it consisted entirely of the bodies of the curious and anomalous creature called *Appendicularia*. The circumstances under which they were taken, and the profusion of objects of more immediate interest, prevented our doing more at the time than making a slight sketch of their form and colouring.

In a very interesting memoir published in the "Philosophical Transactions" for 1851, Mr. Huxley has given a fresh and full account of the anatomy of this curious type, for whose observation he had abundant opportunities when voyaging in the southern Pacific. He maintains that it is neither an Acalephe as supposed by Chamisso, or a Pteropod as conjectured by Martins, but one of the *Tunicata,* of which group it is the lowest form, connected on the one hand with the *Salpæ,* and on the other with *Pelonaia,* and representing permanently the transient tadpole condition of the Ascidian larva.

The shape of this minute creature is that of an oblong body, furnished with a long curved compressed lanceolate tail or fin; by the vibrations of this latter organ it propels itself rapidly through the water.

This brief and imperfect notice of its existence in the British seas may call attention to it, and induce some of our zoologists to search for and investigate our native species.

ACEPHALA LAMELLIBRANCHIATA.

Vol. i. p. 66. TEREDO NORVAGICA.

Mr. Cocks, of Falmouth, writes us word, that this usually scarce species in England is only too prolific in his neighbourhood; the piles and the wood-work of the quay being replete with shipworms. "I have been informed," he continues, "by several sailors, that the worm is common in the mud creek between Flushing Passage and Penryn (both in the immediate vicinity), and that ships and wood allowed to remain long in that situation are sure to be attacked by the worm."

Vol. i. p. 74. T. NAVALIS.

The piles of the signal-posts upon the rocks near St. Peter's Port, Guernsey, were found perforated by this rare ship-worm. (S. H.)

Vol. i. p. 77. TEREDO MEGOTARA.

" Animal vermicular, pale bluish-white, inclosed in a subcylindrical elongated tubular mantle, not of very thin texture, only open anteally and posteally. The specimen examined measured eight inches from the front valves to the terminal pallets, and when the siphons are extended, an inch longer. The anterior part of the animal is enclosed in a pair of hemispherical shining white valves, with a large angular gape in front, and rounded behind into auricles, which, in this species, are much larger than in its congeners; the body and mantle are fixed to them, and proceed under the protection of a testaceous tube to the terminal pallets, which are also encased within the tube.

The branchiæ are invisible until the mantle is opened. There is what appears to be a purple dull red labium on each side the mouth, connected by a thin membrane; these have been termed salivary glands, and may perhaps be such. The oral aperture is subtriangular; the foot in the living animal appears bluish hyaline, but when the moisture is absorbed it is muscular and coriaceous, attached to the body by a thick powerful cylindrical pedicle, and in its centre the terminus of the hyaline stylet is visible; the form of its basal area is that of the anterior gape, which is of a diamond figure, with its angles placed vertically and transversely, but the transverse axes are longer than the vertical. A pair of yellowish-white spatulate appendages are fixed to the posterior extremity of the body. In this animal, besides the anterior and posterior apertures of the shell, there is a rather extensive oval orifice on the dorsal surface of the shell, which is covered by a thick subcircular rough skin, springing from the internal part of the anterior end of the mantle, which appears to have valvular function of closing the orifice." Clark, in "Annals of Natural History," vol. vi. (1850).

Mr. Hanley has lately obtained a tolerable harvest of this hitherto rare species from a submerged plank that had formed part of the cargo of a timber-ship, wrecked off Guernsey some years ago. The excavations made by these specimens (whose stomachs were distended with sawdust) were not lined with calcareous matter, excepting at the exposed or caudal extremity of the more adult ones, where the incipient tube was slightly concamerated as in *Norvagica*. Possibly, then, the large unchambered tubes referred to in the body of our work, although brought to Mr. Hanley by the carpenter he employed, along with the valves, did not belong to them, or possibly the extreme ends had been broken off. The pallets were very variable in shape, ranging in form between that of a kite (with a slight retusion of the broader end) and of the petal of a primrose: the angle of the peaked extremity was remarkably acute. The short, thin, and tapering stalk, though really straight, does not lie level, when the pallet is attached to a card by the outer or convex side, owing to the inward bend of its posterior extremity. In other respects our previous description of a few individuals is not inapplicable to the species.

Vol. i. p. 127. PHOLADIDEA PAPYRACEA.

This interesting mollusk has been found abundantly by Dr. Farran perforating the remains of a submarine forest at Clonea, near Dungarvan, in the south of Ireland.

Valuable notes on the animals of several of the *Pholadidæ* have been published by Mr. Clark, in the fifth and sixth volumes of the "Annals of Natural History" (second series), with many considerations respecting the manner in which they bore.

Vol. i. p. 149. Note to SAXICAVA.

The manifestly immature state of the specimens here alluded to, forbad any positive allocation of them. Mr. Jeffreys having now forwarded us a larger example (a single right valve), received from the late Professor Macgillivray, measuring nearly half an inch in length, and fully a quarter of an inch in breadth, has enabled us to positively declare that they are not *Saxicavæ.* The hinge being developed exhibits a rather small and somewhat triangularly spoon-shaped cartilage receptacle, jutting out below the level of the cardinal edge, and running very obliquely from the beak hindward: it rises somewhat towards its broader extremity, yet is not very much elevated above the level of the anterior part of the hinge plate. Renewed examination of the original tiny specimens elicits the fact, that there is present in them also a most shallow similar pit that lies in the somewhat thicker (in proportion) substance of the cardinal plate, and does not project to any extent above or beneath it. The large valve, which is somewhat tortuous, a little ventricose, and subplicated internally, clearly shows its subnacreous structure; a slight linear ridge runs from near the beaks behind the front scar: the ventral edge is slightly yet decidedly convex. The pallial sinus is not perceptible in any of the specimens; the lateral muscular scars are well impressed, particularly the conical front one, and both of them are seated high up.

Of our British shells the nearest approximation to this hinge is found in *Thracia distorta*, and how far individuals of that polymorphous species, when not imbedded, may approach it in shape, we cannot say. One might be tempted to imagine it the *Mytilus plicatus* of Montagu and Laskey, said to be found at Skye, but neither its delineation nor the affirmed angularity of its broader extremity answers to the characteristics of our shell. Notwithstanding that we cannot identify our specimens with any described shell, we shrink from the responsibility of naming a species whose specialities have only been observed by us in a single valve, and some very immature individuals.

Vol. i. p. 174. PANOPÆA NORVEGICA.

Mr. Richard Howse has obligingly communicated a drawing of the animal of this rare shell, with the following description drawn up by Mr. Clark.

"Animal oblong, thick. The branchiæ are extensive but not deep, well arcuated on the body, the upper one lapping about half on the surface of the under one; they are very long, and after quitting the body they gradually taper, becoming linear, and are prolonged to nearly the extremity of the siphonal apparatus, terminating in sharp points. The tube is at least seven inches long, and the branchiæ cannot be much less. On the body part of them the pectinations are visible, but not strong; and on the same portion, the colour is drab, aspersed rather sparingly with minute bistre-coloured points. The palpi are long, slender, delicate, pointed, and triangular, united around the mouth, pale drab, smooth without, and finely marked within. The body is of a rather thick oval mould, pale pinkish drab; from its centre a very small byssal-grooved foot proceeds, which, as far as I could judge, would, when exserted, resemble that of *Gastrochæna* or *Saxicava* and certainly be less linguiform than that of *Mya.* The liver is, as usual, green. In other respects there was nothing peculiar in the aspect of this animal. I found no actual byssus at the heel of the groove."

Vol. i. p. 190. Sphænia Binghami.

An examination of a larger number of individuals enables us to correct our description of the hinge in the right valve. In front of the oblique and subtrigonal cartilage-pit (erroneously called tooth-receptacle in the body of our work), which slopes inward beneath the general level of the margin, is a more or less manifest low-seated denticle, which sometimes is even elevated as a curved conic tooth, or pressed down and arching towards the umbo, but rarely, if ever, projects perceptibly above the edge.

Vol. i. p. 204. Poromya granulata.

Living specimens of this interesting bivalve were taken by Mr. M'Andrew, in August, 1851, near Kyleakin, in Skye. Our friend has kindly forwarded a note of the appearance of the animal and a slight sketch, which we have had engraved. " The animal," he writes, " is very beautiful, of a kind of cream-colour, and expands in the siphonal region like a flower, the petals of which are represented by a fringe of eighteen or twenty tentacles surrounding the bases of the two siphons, and, generally, but not always reflected upon the shell. The siphons are short; the anteal one largest. The foot is long, narrow, and slender, and very transparent. The mantle is open in front." Our conjecture of the close affinity of this genus to *Neæra* is evidently correct.

The examination of a second less inequilateral specimen of this rare shell induces us to surmise its identity with the *Embla Korenii* of Lovèn (Ind. Moll. Scand. p. 46). His very elaborate details taken avowedly, like our own account, from a single individual, differ somewhat from our description, yet are not absolutely opposed to it; more stress, however, is laid on characters, which we have failed to detect as positively developed. The original, and then unique (as native) example entrusted to our care for description being very fragile, we ventured not to open its closed valves; the peculiar dentition was, consequently not observed.

The valves are furnished with a short hinge-plate that extends only immediately beneath the umbones. In the right valve this plate is armed, just below the beak in front, with a strong and prominent bluntly cloven tooth, which rising from the lower edge, curves with some slight obliquity upwards; a short and very small triangular cartilage-pit occupies the upper portion of the area behind it; the rest of the surface, which is more or less trigonal, is level or slightly hollowed. In the left valve, the hinder half of the plate is slightly hollowed out, excepting at the lower edge, as a subtrigonal shallow depression, that is barely divided in front below by an obscure thin ridge, from the tiny but deep triangular excavation (which receives the opposite tooth); the remaining level or slightly raised anterior surface, which projects a little, with a somewhat bifid extremity, above the latter, into the larger triangle, suggests the idea of a complicated dentition.

Vol. i. p. 284. DIODONTA FRAGILIS.

The Galway coast furnishes this local shell in comparative abundance (Dr. Melville).

Vol. i. p. 290. TELLINA BALAUSTINA.

Mr. Barlee has dredged this beautiful species at the Arran Isles, on the west coast of Ireland, and also on the north, east and west of the Zetland Isles.

Vol. i. p. 295. TELLINA PYGMÆA.

Mr. Hanley has recently dredged it near St. Peter's Port, Guernsey.

Vol. i. p. 307. TELLINA PROXIMA.

Plate CXXXIII., f. 3.

Since our notice of this species, a single valve (that delineated in our engraving), together with the fragment of two united by the ligament, have been dredged by Mr. M'Andrew, in from forty to sixty fathoms of water, near the Great Fish-bank in the North Sea, about one hundred and forty miles from the nearest land; others were also taken by him at various distances from the Northumbrian coast.

It is the shell termed *calcarea* * in Mr. Hanley's Monograph of *Tellina*, and chiefly differs from the typical form of *proxima* in being much more elongated, and all but equilateral. An enlarged experience of the variation permitted to each species, and an anxious wish to avoid any unnecessary addition to the names in our Fauna, induce us to regard it provisionally as a variety of *proxima*.

The specimen, which measures an inch and a quarter in length, and an inch and five-sixths in breadth, is precisely similar to an example that we received from the Gulf of St. Lawrence. It is subovate, moderately convex, somewhat bent, rather strong, of an opaque and chalky white on both sides, clothed with a dark ash-coloured epidermis, and is irregularly and slightly wrinkled in a concentric direction. The ventral margin is retuse in the middle, but judging from the lines of increase, this is not the case in the earlier stages of growth; it is more arcuated and ascending in front, than behind. The anterior side is slightly the longer, and is well rounded at its extremity; its dorsal edge, except near the acute and prominent beak is convex, and but moderately declining; the dorsal slope is straighter and more decided on the posterior side, whose extremity is bluntly wedge-shaped. Neither the umbonal ridge nor the ventral flexure are conspicuous. The ligament is large and somewhat projecting. The hinge has no lateral teeth, and merely displays a narrow bifid primary one in front, with a still thinner simple one behind it. The siphonal scars are profound and large; the pallial sinus is ample and elongated.

---

* *T. sordida*, PHILIPPI, Neue Conch. vol. ii. pt. 9, pl. 5, f. 6.—*T. calcarea*, HANL. (as of Chemnitz, whose species is far from clear) in Sowerby, Thesaur. Conch. vol. i. p. 314, pl. 62, f. 183.—*T. lata*, LOVÉN, Ind. Moll. Scandin. p. 41 (as of Gmelin, whose species is solely derived from Lister's figure).—MIDDEND. Sibiris. Reise, vol. ii. pt. 1, pl. 23, f. 4, 5.

Vol. i. p. 341. ERVILIA CASTANEA.

Mr. Barlee has dredged living examples in ten fathoms water at the Arran Islands, on the west coast of Ireland; and Mr. M'Andrew has found the same interesting shell on the coast of Spain.

Vol. i. p. 354. MACTRA TRUNCATA.

The sight of a large number of magnificent Irish specimens in the possession of Mr. Damon, has greatly unsettled our notions of this supposed species. It must, we suspect, be referred to *solida*, as an aberrant ventricose variety. The triangular outline, and the projection of the beaks, which in certain examples are not more oblique than in the typical *solida*, result from the greater declination of the dorsal edges, which produce, of necessity, a greater arcuation of the ventral margin. We believe it will be found an invariable rule, that the relative proportions of the dorsal and ventral edges are fixed in each species, but that considerable latitude is permitted to the umbonal angulation. As a natural consequence, the contraction of the angle at the beaks must effect a corresponding increased curvature of the opposite margin, since otherwise its length would be diminished; and a dilatation of the angle must produce an equivalent lesser degree of convexity, or else that edge would not be long enough to meet the dorsal extremities. The bow in archery, which becomes curved in proportion to the angle formed by the drawn string, will clearly illustrate our meaning.

Vol. i. p. 370. LUTRARIA ELLIPTICA.

Of this shell we have two very distinct forms; the broad one, which we have figured, and an elongated variety which approaches in some respects to *oblonga*. In the former the dorsal edges are usually more convex, and have a greater declination than in the latter, where, for the most part, they are more or less retuse towards the beaks.

Vol. i. p. 452. ASTARTE SULCATA.

Plate XXX. f. 5, 6 and CXXXIII. f. 4.

By copying the erroneous numerals of the writing engraver, we referred figure 5 in the body of our work to *A. triangularis.* Figure 4 of our supplementary plate represents the sharp narrow ribbed form. Figure 5 of the earlier engraving is intended for the variety with a coloured interior.

Vol. ii. p. 29. CARDIUM PYGMÆUM.

A small variety has been taken at Unst by Mr. M'Andrew, which has the ribs rather more prominently defined and further apart than in the majority of our English examples.

Vol. ii. p. 72. MONTACUTA FERRUGINOSA.

Mr. Alder has communicated to the fifth volume of the Second Series of the "Annals of Natural History," a more complete account of the animal of this shell. Respecting it, among other particulars, he observes that the mantle shows a new modification of that part, intermediate between the plain anterior siphonal fold of *Kellia rubra,* and the more elaborate form of mantle in *Lepton squamosum.* The anterior portion of the mantle is ample, and produced considerably beyond the shell, forming a kind of frill, which becomes gradually smaller and more even as it passes along the base of the shell. Its exterior circumference, lining the shell, is fringed with very delicate filaments, rather short and blunt, which extend completely round the margin of the valves, with the exception of a small space at the umbones. The mantle is open throughout the entire front and base of the shell, but closed posteriorly, and not produced into a siphon. Some interesting notes are recorded on the development of the embryo.

In the description of shells of the *Montacutæ* given in the text, the terms "posterior" and "anterior," as applied to the extremities, should be reversed, except in the case of *Montacuta substriata,* where they are correctly employed.

Vol. ii. p. 102. LEPTON CONVEXUM.

Mr. Alder, with his usual candour, has forwarded us a suite of specimens to prove that his *L. convexum* is the same species as the *nitidum* of Turton (our *Kellia nitida*). The finding of several additional specimens at Cullercoats, and the capture of no less than eighty examples ! from the coralline region, at Exmouth by Mr. Clark (who had arrived at the same conclusion as to the identity of the shells) has demonstrated the remarkable fact that the punctures which in certain individuals pervade the entire surface, in others are only present on the umbones, and are often so obscure, yet we believe never wholly absent, although not perceptible with an ordinary glass, in worn examples, such as the original types of *nitidum* were, as to be almost invisible. In the smoother variety there are usually regular, though very fine and rather distant concentric striæ ; in the more ornate variety, the crowded punctures are smaller and more circular upon the umbones, increasing in size and irregularity of contour beneath them, so as at times to assume the appearance of short rough and slanting scratches. Our description of *Kellia nitida* applies fairly enough to all the specimens, we should add, however, that the outline is bluntly subquadrangular. As the animal scarcely differs in the least (teste Clark) from that of *squamosum*, the species must be restored to its original allocation, as *Lepton nitidum*. The observations of Mr. Clark upon the animal show that the shorter and more obtuse extremity of the shell is the posterior (not, as in text, anterior) end.

Mr. Hanley has dredged the more characteristic *convexum* from a coralline bottom near St. Peter's Port, Guernsey.

Vol. ii. p. 103. LEPTON CLARKIÆ, Clark.

Very inequilateral, obliquely oboval, not shagreened.

Plate CXXXII., f. 7.

Lepton Clarkiæ, CLARK, Annals Nat. Hist. 2nd ser. 1852, March and April.

Shell minute, obliquely oboval, snow-white, very thin, compressed, somewhat shining, not shagreened, but most closely set with extremely fine and microscopical concentric striolæ, which are more easily perceptible towards the margin; occasionally, too, marked upon the disk with interrupted diverging scratch-like lines. Sides decidedly unequal, both of them rounded, the anterior twice the length of the posterior one. Dorsal edges not angulately shouldered, but descending with a moderate and convex declination; slope of the shorter side rather the more sudden. Ventral edge convex in the middle, arching upwards at the shorter extremity, well rounded at the other; entire within. Beaks only moderately prominent, having a distinct calyx. Hinge of the right valve with a strong erect simple acutely conical anterior apical tooth, that points very obliquely but straightly forwards, on either side of which run the lateral laminæ, which are nearly equidistant from the beak, and almost appear double (though not actually so), from composing, with the edge of the shell, a receptacle for the less distinctly perceptible laminæ of the opposite valve; in this latter the sub-triangular apical tooth is so contiguous to the front lateral, as almost to form a part of it. Length barely a line. Dredged by Mr. Clark, from the coralline region of Exmouth; Plymouth (Barlee).

Vol. ii. p. 186. M. PHASEOLINA.

Mr. Hanley has recently dredged a specimen of this scarce species from deep water near Castle Cornet, Guernsey.

Vol. ii. p. 194. CRENELLA.

Two well preserved specimens of *Crenella faba* were given to Professor King by a Newcastle bird-stuffer, as taken from the stomach of a duck, purchased at the adjoining parish of Gateshead. The evidence of their indigenousness is assuredly defective; yet, since it is not impossible that examples of this boreal shell will hereafter be found in the more northern islands of Scotland, to aid their future identification we have appended a brief description.

C. FABA, Müller.

Mytilus faba, MÜLLER, Prod. Z. D. 3015, teste O. FABRIC. Fauna Grœnl. p. 419.—CHEMN. Conch. Cab. vol. viii. p. 184, pl. 85, f. 761

(badly).—GMEL. Syst. Nat. p. 3359.—DILLW. Recent Shells, vol. i. p. 320.—WOOD, Index Test. pl. 12, f. 41 (copied from Chemn.)

Modiola arctica, LEACH, Appx. Ross Voyage, probably.
„ *faba*, HANL. Recent Shells, p. 242.

Shell of an oblique rounded ovate figure, moderately ventricose, with a glossy reddish olive-coloured epidermis, marked throughout with numerous radiating depressed costellæ, that are separated by rather narrower shallow sulci, and are indistinctly crossed towards the ventral margin and broader extremity by concentric wrinkles. Both ends rounded; the posterior one broadly and rather bluntly so: the anterior side extremely short, and much narrowed by the upward slope of the arcuated ventral margin. Nacre darkly iridescent. Hinge line a little curved; the cardinal plate, as well as the hinge nodules (of which there are six in the specimen described from), widening quickly anteriorwards. Inner edge strongly crenated. Size, two lines long, nearly three broad.

Vol. ii. p. 241. ARCA RARIDENTATA.

Taken by Mr. Barlee, thirty miles east of Zetland.

ACEPHALA PALLIOBRANCHIATA.

Vol. ii. p. 357. TEREBRATULA CRANIUM.

Four examples of this very rare shell have been procured by Mr. Barlee, thirty miles to the east of Zetland.

Vol. ii. p. 361. MEGATHYRIS CISTELLULA.

Taken by Mr. Barlee, forty miles to the east of Zetland; also in the coralline zone at Exmouth. The generic name, *Argiope*, given by Des Lonchamps, has precedence of *Megathyris*, as shown by Mr. Davidson, whose excellent papers on recent and fossil Brachiopods are especially deserving of study by British malacologists.

PTEROPODA.

Vol. ii. p. 384. SPIRIALIS FLEMINGII.

We had the pleasure, in August, 1850, when cruising with Mr. M'Andrew off the north-west coast of Skye, of observing numbers of this beautiful little pteropod sporting—as it were, dancing—in its native element. When out-spread, its wings extend to much beyond the length of the shell. They are shaped something like the petals of a catch-fly, rather truncated at the extremity, furnished with a small lobe half way down their under-sides, and another small rounded lobe at their lower bases. The body is dark purple, the wings paler, the basal lobes edged with purple. The shape of the wings differ somewhat from that represented in the figure by Souleyet. We have given a fresh figure, from the Scottish animal, in Plate M. M. fig. 1.

GASTEROPODA.

Vol. ii. p. 398. CHITON HANLEYI.

The animal is of a dusky-red tinged with brown. The head is reddish, and has a strongly lobed hood. The mantle is of a tawny grey. The branchiæ are reddish; they reach to about one-third of the length of the body, and are each composed of from eight to ten leaflets.

Vol. ii. p. 405. CHITON ALBUS.

Montagu's specimen of this shell is identical with those described in this work. His brief description, however (Test. Brit. p. 4, from which Turton, Conch. Diction. p. 35) is by no means characteristic, and is more suited to the *Chiton cancellatus*.

Vol. ii. p. 445. PROPILIDIUM ANCYLOIDE.

In the interior of this shell there may be discerned, by the aid of a lens, a minute plate (as in *Puncturella*) at the extreme apex, which separates the spiral portion from the conical.

Vol. ii. p. 472. FISSURELLA.

The *Fissurella Zetlantica* and *F. marginata* of Brown (Ill. Conch. G. B. pl. 12, f. 8, 9, 12, 13,) are not published by him as veritable species (at least they are not referred to in the descriptive portion of his work), but given as copies of the *Patella Zetlantica* (Turt. Diction. p. 142), and *marginata* of Dr. Fleming's article on British shells, in the "Edinburgh Encyclopædia" (pl. 204, f. 5, 6). The author has virtually withdrawn these from our Fauna by the absence of all reference to them in his subsequent, and very superior work ("British Animals"). Assuredly they are no *Fissurellæ* and were probably (if the habitation of mollusks at all) no more than fragments, or single valves of *Anomiæ.*

Vol. ii. p. 515. TROCHUS TUMIDUS.

The *Trochus fuscus* of English conchology (ADAMS, Microsc. pl. 14, f. 24.—MONT. Test. Brit. p. 289.—MAT. and RACK. Trans. Lin. Soc. vol. viii. p. 154) is solely derived from a wretched figure in Walker's "Testacea Minuta," which was not improbably designed to represent the *T. tumidus.*

Vol. ii. p. 535. MARGARITA AUREA.

Through the kindness of Sir Walter Trevelyan we have been enabled to determine this species, by an examination of the typical example. It is a Mediterranean species, described by Philippi (Moll. Sicil. vol. i. p. 179; vol. ii. p. 151) as the *Turbo sanguineus* of Linnæus, and by Michaud (Bullet. Lin. Soc. Bordeaux, vol. iii. 1829, and Descript. Nouv. Coq. 1829, p. 6) as *Monodonta Belliæi.*

Vol. ii. p. 549. IANTHINA COMMUNIS.

Plate CXXXIII. f. 1.

Until the genus *Ianthina* shall have experienced a thorough revision, and the effect of local circumstances in producing variation of colouring, chasing, and contour upon its migratory members shall have been duly estimated, it will be hazardous to define the limits of the several varieties or species which by the past generation of conchologists were included in the *Helix Ianthina*, by the present in the *I. fragilis* or *communis.* Krauss, in his useful work on the testacea of S. Africa, remarks that the indigenous shell figured by Chemnitz (Conch. Cab. vol. v. pl. 166, f. 1577, 1578) is very distinct from the Neapolitan one termed *bicolor* by Philippi, though both are usually cited as identical. Our British examples again, seem different from either, and were considered so by Dr. Leach, who, we are informed by Mr. Jeffreys, termed them *Britannica.*[*]

The pale basal zone, however (it seems always present in the younger specimens), is assuredly of not more than varietal importance; Mr. Cuming possesses fine adult examples, taken alive by himself at Peranzabuloe, in Cornwall, in which the band is sometimes conspicuous, sometimes partially apparent, sometimes entirely obsolete.

As the shell delineated in Plate LXXIX was immature, we have likewise given a representation of a fully grown specimen in Plate CXXXIII. The latter, which is taken from an Irish example, much resembles the engraving in Brown's "Illustrations," and differs from those previously described in so many particulars that it becomes of importance to specify them.

The shape is not horizontally compressed as in the *bicolor* of Philippi, but is almost biconoidal; the spire, which is about equal in height to the aperture, being elevated, and the lower disk comparatively produced, so that the length is very nearly equal to the breadth; the extreme width is as often below the middle, as at the middle itself. The rapidly increasing volutions are not flatly shelving as in the Mediterranean examples, but decidedly convex; the infrasutural retusion of the last-formed whorls though present, is far from conspicuous. The periphery of the body is but little angulated. The volutions of the spire are not remarkably short, the dorsal breadth of the penult turn being for the most part to its length as five to two. The tortuous pillar lip, which does not occupy one half of the total length of the shell, sweeps towards the outer lip in an oblique curve.

---

[*] Our foreign synonymy was drawn up in the belief, that the British examples were specifically the same as those of the Mediterranean. Should this supposition prove erroneous, most of our references (the figures of the two Sowerbys, of Reeve, Blainville, the Penny Cyclopædia, and probably Crouch) must be expunged and transferred to the latter.

A more than ordinary latitude seems permitted to shape in this species, because the larger turns do not always strictly coil in a regular spiral, but sometimes deflecting attach themselves below the periphery: in which event the spire is wont to become more elevated, and its more rounded turns to swell out in some degree above the suture.

Vol. iii. p. 2. NERITINA.

In our text the operculum is described as corneo-calcareous. It is really, as Mr. Gray pointed out, solid, calcareous, and with a thin edge, whilst *Nerita* has a corneous operculum, lined on each side with a calcareous coat, so that it can be split into two plates.

Vol. iii. p. 8. PALUDINA LISTERI.

The same name (*vivipara*) having been applied to this and the succeeding species, we erroneously located the bandless *Paludina* taken by Mr. Pickering, as a variety of the former instead of the latter. We withdraw the doubt expressed respecting the Lancashire locality, Mr. Glover, of Manchester, an excellent authority, having (as we are informed by Captain Brown) taken it himself near Southport. *P. vivipara* has been taken by Captain Brown abundantly in the canal near Birmingham.

Vol. iii. p. 53. LITTORINA PALLIATA.

The remark, that the *L. palliata* must, probably, be included in *L. littoralis*, is not to be understood as referring to the veritable N. American species, but solely to the British specimens usually identified with it. The *L. fabalis* seems intermediate in character between the two; it differs from the former in the breadth and concavity of the surface of the pillar lip; from the latter (*littoralis*), in the roundness of its volutions, and the elevation of the spire in the more mature individuals. Our figures, drawn from immature examples, are not characteristic, the aperture of the adult not being so angular below, but well rounded and diminished in expansion by the breadth of the liver-coloured pillar lip. The specimens now before us measure a quarter of an inch wide, and do not exhibit any nearer approach to *littoralis* than those before described; yet the aggregate of differences between the two is not comparable to that which exists between the typical *rudis* and its variety *tenebrosa*.

Vol. iii. p. 62. LACUNA VINCTA.

We are disposed to refer to this species the *Turbo auricularis* of Montagu (Test. Brit. vol. ii. p. 308, from which, Maton and Rack. Trans. Lin. vol. viii. p. 166; Turt. Conch. Diction. p. 206; Dillw. Recent Shells, vol. ii. p. 844; Flem. Encycl. Edin. vol. vii. pt. 2, pl. 205, f. 6; *Cingula auricularis*, Flem. Brit. Anim. p. 307).

Vol. iii. p. 72. RISSOA.

In the "Annals of Natural History" for October, 1852, our friend, Mr. Clark, remarks upon the *Rissoæ*, that *costulata*, *rufilabris*, and possibly *labiosa*, are varieties of *parva*, that *pulcherrima* is a dwarf nearly ribless *inconspicua*, and *littorea* apocryphal as British. With every respect for his talents as a malacologist, we are compelled very frequently to dissent from his conclusions as a conchologist.

Vol. iii. p. 84. RISSOA BEANII.

Mr. Clark notes upon the animal of this species (described by him as *R. reticulata*, Montagu, and as including *R. sculpta*), that the "rostrum near its termination at the upper surface, appears to have attached to it two very small similar shields, one on each side, independent of the terminal, minute, subcircular, flat lobes. The eyes are at the external angles of the rather long, slender tentacles, and are placed on short light-yellow or orange pedicles. The foot is subrotund, scarcely auricled. The terminal part of the operculigerous lobe is furnished with three blunt, cylindrical, short cirrhi."

The animal of *Rissoa punctura* closely resembles the preceding; the operculigerous lobe is a very pale muddy reddish brown, marked on each side close to the junction of the foot with the body, with an irregular, rather large, dark smoke-coloured stripe. There is also under the neck, near the eyes, a small red dot.

Vol. iii. p. 92. RISSOA COSTATA.

Mr. Clark notes that the animal is hyaline white, except the large black eyes and pale red buccal disk. The tentacula are long and flat The foot is not auricled in front, and is rounded behind. There is a single distinct caudal cirrhus.

Vol. iii. p. 117. RISSOA SEMISTRIATA.

Mr. Clark has observed the animal of this species, and describes it along with the preceding in the "Annals of Natural History," for October, 1852. It is white, with a pale tinge of yellow. The mantle is even with the shell, except a short minute filament, that is protruded from the portion which lines the upper angle of the aperture. The head is short, with rather long divergent, flattish tentacula, having slightly clavate tips and eyes on gently raised prominences at their external bases. On the tail there are three cirrhi, of which the middle one is longest.

Vol. iii. p. 125. RISSOA VITREA.

We have taken this animal alive in fifteen fathoms water, off Oban. It is entirely of a translucent white, except the rather long and somewhat bilobed muzzle, which, owing to the dental apparatus within, appears tawny. The tentacles are subulate, somewhat flattened, rather, but not very long, obtuse but not clavate at their tips. The eyes are small, and placed at their bases, superiorly and centrally. When the animal crawls, the eyes are usually concealed under the transparent margin of the shell. The foot is rather broad, oblong, somewhat spreading and bilobed in front, with broad obtuse auricles; behind, it is rather short, flattened, and terminally rounded. The opercular lobe is very short, rounded, and quite simple, there being no cirrhus. The operculum itself is rounded, thin, and of a very pale horn-colour.

Mr. Clark has also met with and described this rare animal. His account of it is substantially the same; he notices, however, setæ on the ends of the tentacles, and describes the operculum as clear white.

Vol. iii. p. 127. RISSOA PROXIMA.

Mr. Clark has been so fortunate as to take this mollusk alive, in fifteen fathoms water, off Exeter. He states that it is of a brilliant subhyaline white hue, specked with opaque white flakes, and tinged with claret red on the neck. The mantle (as in the last species) is even. The muzzle is short, subcylindrical, and obtuse. The tentacula are flat, strong, rather short, smooth, minutely claviform at the tips, which are each clothed with six comparatively long, intensely aciculate setæ. The eyes are unusually large, black, and placed on bulgings at the external bases of the tentacula. The foot is large, fleshy, grooved in front, deeply indented in the centre, and produced at the angles into large, long, pointed auricles. The tail is divided into two long distinct streamers. Above the bifurcation is a small opercular lobe, without any filament. The operculum is white, horny, suboval, and of four or five whorls.

Vol. iii. p. 131. Rissoa soluta.

This species has been taken alive by Mr. Clark in fourteen fathoms water, off Budleigh Salterton, Devon. The animal is hyaline white, except the small eye bulgings, which are pale sulphur yellow, and the black eyes. The tentacula are moderately long, rounded at the tips, very pilose, the setæ springing from them horizontally, but are only visible with high powers. The foot is subtruncate, slightly auricled, and long and narrow. No caudal cirrhus was detected. The operculum is suborbicular, and attached near the extremity of the foot.

Vol. iii. p. 132. Rissoa? littorea.

In our description of this rare shell we expressed our doubts respecting its true generic position, and quoted, in illustration, the account of the animal of the *Truncatella littorina* of Philippi, the type of the genus *Paludinella*, of L. Pfeiffer. In the "Annals of Natural History," for November, 1852, is a short notice by Messrs. H. and A. Adams, in which a new arrangement of the British Rissoæ is proposed, one that seems to us based on a misconception of the value of the characters adduced, and of the purpose of generic appellations. In this paper is the only published notice of the animal of the British *Rissoa littorea*, for which the genus *Paludinella* of Pfeiffer is retained, although the account of the position of the eyes, and the statement that there is no opercular lobe (from which we should infer the absence of an operculum), is in discordance with the characters noticed by Philippi, and cited by Pfeiffer, as distinctive of his proposed genus.

We have lately (November, 1852), taken a number of living specimens; and, after an examination of them, have come to a somewhat different result. The animal is fleshy and bulky for its size, entirely white and translucent, except the black eyes and a tinge of tawny on the muzzle, caused by the presence within of the armature of the mouth. The head is of moderate size, and provided with a very large, broad, and somewhat bilobed muzzle vertically cloven beneath. The tentacles are rather short, stout, linear, obtuse at their tips, a little below which they bear the conspicuous eyes. There are no capital or lateral lobes or cirrhi. The sides of the foot are high and rather steep. On its caudal portion there is a simple operculigerous lobe, bearing an ovate, very thin, yellowish, paucispiral operculum. The sole of the foot is oblong, slightly truncate, with rounded angles in front and rounded behind; when at rest it is subquadrate. These characters accord best with, and do not differ materially from, those of the genus *Assiminia;* nor is the shell so different in structure as to prevent our slightly modifying the diagnosis of that group, so as to admit more delicate forms than the *Assiminea Grayana.* They do not accord exactly with those assigned to *Paludinella*, though we think it probable that our shell is really the type of that genus. We think it likely that in this form we have indications of the true relations of *Truncatella* and *Otina*, and that both those genera should be placed among the *Littorinidæ*, and not beside the *Pyramidellidæ.*

Assiminia littorea was found by us in crevices of fresh water limestone, near high-water mark, at Whitecliff bay, in the Isle of Wight. It was living in company with *Conovulus bidentatus*, in situations similar to those in which we have gathered *Otina otis.* Some years ago we collected numbers of a very similar, if not identical, little *Assiminea* (so styled at the time in our notes, on account of the structure of the animal), under stones and weeds at high water mark, at Toulon. The British specimens thrive in confinement if kept in a jar, simply moistened with salt water.

Mr. W. Thompson, of Weymouth, has obtained this very local species from the estuary, near Portland, where he found it in company with *Conovuli* and *Truncatellæ*, near high water mark, under such stones only as were kept moist by a deepish layer of dead *zostera* weed.

In Plate MM. fig. 3, we have represented the animal.

Vol. iii. p. 138. RISSOA VENTROSA.

To the synonymy of this shell add *Turbo eburneus*, ADAMS, Micros. pl. 14, f. 15, probably.

We have given a delineation at Plate CXXXIII. f. 7, of a shell which we have considered with some little doubt, a produced imperforated variety of this species. It differs, however, from the more typical form in the following particulars. Its colour is deep fulvous; its volutions are of rather quicker enlargement, and not so decidedly swollen; the breadth of the penult turn is not quite double its height. There is no well pronounced chink, as the pillar lip, instead of being elevated, is attached, or very nearly so, and connected by a layer of white shelly matter (or enamel) with the outer lip. In several of our specimens, which were received from Mr. Pickering, as taken at "Grays;" the apices were truncated.

Vol. iii. p. 139. TURBO DISJUNCTUS.

Fleming has likewise figured this shell in the "Edinburgh Encyclopædia" (vol. vii. pt. 2, pl. 205). His representation seems derived from Laskey's drawing, but shows the whorls more regularly and compactly coiled, so as to approach still nearer to *ventrosa*.

Vol. iii. p. 154. JEFFREYSIA OPALINA.

Plate CXXXIII. fig. 6, and (animal) Plate MM. fig. 2.

Having now received examples of this *Ampullaria*-like shell, that measure nearly two lines in length, we are enabled to amend the description and figure we had derived from immature individuals. When adult, the shape is ovate-conoid, and the fragile shell, which is composed of four ventricose coils, that swell out so abruptly from the suture, as to produce an obscure shoulder near the outer lip, exhibits some minute and crowded longitudinal wrinkles on the upper part of the body-whorl, which latter occupies three-fifths of the entire length. The penult turn displays a rapid increase of growth. The apex is blunt, but is symmetrically coiled. The large mouth, which is about as long as the spire, is of a subpyriform ovate figure. The outer lip juts abruptly from the body. The pillar lip is white, continuously oblique (not twisted), not to be called broad, and more or less curved at its anterior extremity. The chink is wholly or partially concealed.

The animal has been examined by Mr. Alder and by Mr. Clark; it proves to be a true *Jeffreysia*, differing from the *dia-*

phana in the form of its lower tentacles. The muzzle is short and broad, strongly tinged with brown on the centre and up to the head. The tentacles are all four stoutly subulate and white. The eyes are placed far back, rather close together, and are surrounded by pale rings. The anterior angles and extremity of foot are obtuse.

Vol. iii. p. 155. JEFFREYSIA GLOBULARIS. Jeffreys, MS.

Obliquely orbicular, strongly umbilicated.

Plate CXXXIII. fig. 5.

Were it not for the membranaceous operculum, whose nucleus is lateral (adjacent to the middle of the pillar lip), this minute and fry-like species might readily be taken for a young *Valvata*.

It is obliquely orbicular, excessively fragile, and of a transparent shining and somewhat iridescent bluish white, but more usually is coated with an olivaceous crust; the surface is nearly smooth, exhibiting only some indistinct wrinkles of increase, chiefly apparent near the outer lip, in the few individuals we have examined. The three rounded volutions, which compose the shell, are of quick increase, and swell out abruptly, from the simple, yet profound, suture, both above and below. The spire occupies from one-third to two-fifths of the dorsal length; the penult turn is more than twice as broad as it is high; the apex, which is symmetrically coiled, is blunt or retuse. The surface of the lower disk is much rounded, and pierced by a large umbilicus, whose capacious mouth is not spirally sculptured, but is more or less wrinkled lengthways. The periphery of the body is bluntly rounded. The aperture, which projects both laterally and at the broadly rounded anterior extremity, occupies about four-sevenths of the total length, and fully one-third of the ventral area: it is of a rounded ovate figure, as the body does not project into the mouth. The lips, which are united at both ends, so that the peristome is entire, are neither thickened nor reflected; the outer one is much arcuated, and simple edged; the inner one is elongated, erect, and subarcuated. The breadth is scarcely the twelfth of an inch. A few specimens were taken by Mr. Barlee at Skye and the Shetlands, in company with *J. opalina.*

Vol. iii. p. 158. SKENEA? NITIDISSIMA.

Several conchologists believe this shell to be identical with the *Helix bicolor* of Adams (Trans. Lin. vol. v. pl. 1, f. 25, 26, 27, from which Mont. Test. Brit. vol. ii. p. 447; Mat. and Rack. Trans. Lin. vol. viii. p. 205; Turt. Conch. Dict. p. 58; *Turbo bicolor*, Flem. Brit. Anim. p. 301; *Spira bicolor*, BROWN, Ill. Conch. G. B., p. 20, pl. 8, f. 50, 51).

That shell, said to differ from *H. nitidissima* in being *perfectly* devoid of lustre or striæ, and having a white mouth, is so obscurely defined, "Testâ lævi, duobus anfractibus, vix umbilicata," that we shall not attempt to pronounce what it was meant for. It would be well for science if some of the crudities of Walker and Adams * could be consigned to oblivion.

Vol. iii. p. 161. SKENEA? DIVISA.

This curious shell and some allied forms, referred to *Skenea* with a doubt, we ventured to predict would eventually prove to be allies of *Trochus.* Some very similar fossils had been placed by Mr. Searles Wood in *Adeorbis,* in all probability the true place of the recent forms in question also. The discovery of the animal of several, by our indefatigable friend, Mr. Clark, has confirmed our surmises regarding their affinities.

The animal of *Skenea? divisa* has "a rather long, broad, finely wrinkled proboscidal muzzle. The tentacula are long, flattish, frosted on the central line, not irregularly setose on the edges, but most elegantly clothed, each on both sides, with twelve to fourteen long hyaline cilia, arranged in symmetrical series, inclining obliquely from base to point, and diminishing in length in like manner. The eyes are very large, black, and lateral, attached nearly at the external bases on round inflations to the main stems, *there being no distinct pedicles.* No head-lobes were detected. There are two neck-lappets of different form, the one on the right side being narrowish, flat, and semiserrated; that of the other side shorter, suboval, and plain. The foot is subtruncate or rounded in front, superficially labiated, forming at the angles long curved linear auricles; it is moderately long, and rather obtuse behind. The operculigerous lobe is plain; it carries, near the extremity, a circular corneous close-set spiral operculum of from six to eight turns, and on each side, at equal distances, three not very long nor slender flattish tentacular filaments. The genitale springs under the right tentacle; it is flat-pointed, and lies horizontally, nearly extended to outside the aperture, not reflected in the branchial vault. The excretory canal is a short pendant cylinder on the right side, just above the first vibraculum." Mr. Clark's observations, of which the above is an abstract, were made on individuals taken in the coralline zone, in fifteen fathoms water, off Budleigh Salterton. He remarks that it is an active and not shy creature.

---

* Amongst others may be specified the *Helix tubulata* (Lin. Trans. vol. iii. p. 67, pl. 13, f. 35, 36, from which Mont. Test. Brit. vol. ii. p. 446; Mat. and Rack. Trans. Lin. vol. viii. p. 204; Turt. Conch. Dict. p. 57; *Turbo tubulatus*, Flem. Brit. Anim. p. 301; *Spira tubulata*, Brown, Ill. Conch. G. B. p. 20, pl. 8, f. 46) a species manufactured from the mere fragment of a shell, and the *Helix unispiralis* (from Walk. Test. Min. Rar. fig. 27; MONT. Test. Brit. p. 443; Mat. and Rack. Trans. Lin. vol. viii. p. 204; Turt. Conch. Dict. p. 57; *Delphinoidea unispiralis*, Brown, Ill. Conch. G. B. p. 19, pl. 8, f. 32, 33) constituted from a single whorl of what was possibly a species of *Skenea.*

The sinistral *Turbo lævis* of Turton (Conch. Diction. p. 230) derived merely from Walker's figure (35) looks something like an accidentally reversed *Rissoa*, but what it was designed for we presume not to conjecture.

Vol. iii. p. 164, SKENEA? CUTLERIANA.

Plate CXXXII. fig. 4, 5.

We are enabled to amend our description of this shell from additional specimens having been forwarded to us by the author of the species. Our surmise, that it was no *Skenea* is confirmed; it belongs rather to the section *Margarita* of the genus *Trochus.*

The shape is not orbicular (as we erroneously stated), but obliquely subglobose, and the whitish surface is slightly tinged sometimes with orange, sometimes with pink, in the recent examples. The shell is ordinarily a little iridescent towards the mouth, and on the upper whorls so far translucent that the orange yellow hue of the dead mollusk may be perceived near the apex. The spiral striæ are very decided, and beneath the microscope often seem to be punctated. The base or anterior disk is much rounded, and the sudden perforation is not broad-mouthed. The aperture nearly occupies one half of the ventral area; the body-lip is free except at the posterior extremity, near which it curls back a little.

Mr. Clark has noticed the animal. The cilia of its tentacles and cirrhi are less close-set than in *Skenea? divisa*, the curved auricles of the foot flatter and broader; the foot more rounded at both extremities, and the bulgings for the eyes were prominent. The animal is very active.

Trochus pusillus, according to Mr. Clark, has a very similar animal.

Vol. iii. p. 167, SKENEA? COSTULATA.

In consequence of the specimen having been lost, it could not be engraved on the plate referred to in our text. We are indebted to our kind friend Mr. Alder for an original drawing, (Plate CXXXII. f. 1, 2, 3,) taken from the same shell.

Vol. iii. p. 174. Note to TURRITELLA COMMUNIS.

A second species of *Turritella* is mentioned in Brown's "Illustrations" (p. 9, pl. 8, f. 57, 58), as found at Tenby by Mr. Lyons. We cannot recognize it, but copy the description:—*T. minor.* "Shell acute; with fifteen well defined, rounded, somewhat short volutions, tapering to a sharp point, covered with very fine, regular, spiral striæ; aperture subrotund; outer lip thin. Length three-eighths of an inch, breadth not an inch."

The figure reminds one a little of the genus *Mesalia.* Can it be meant for *Aclis ascaris?* In the stated breadth there is clearly an omission, and judging from the proportions of the figure it should be "not the seventh of an inch."

Vol. iii. p. 192. CERITHIUM RETICULATUM.

Add to the synonyms,—*C. reticulatum var. b.* THOMPSON.

Ann. Nat. Hist. Vol. v. p. 98, pl. 11, f. 8. monstrosity (from type).

Vol. iii. p. 195. CERITHIUM ADVERSUM.

Add to the synonyms,—*Turbo punctatus*, ADAMS, Microsc. pl. 14, f. 21. Although a pallid variety of this species is occasionally procured, we entertain but little doubt, that the large white form mentioned in the Supplement to the "Testacea Britannica," as taken by Bryer and Laskey (equally notable for the discovery! of exotic shells in our Islands), was a West Indian species, allied to, but distinct from *adversum*.

Vol. iii. p. 200. CERITHIUM.

A much worn specimen of a *Cerithium* (or *Cerithiopsis*) whose shape seemed manifestly different from any recognised native species, was long ago placed in our hands by Mr. Alder, who procured it from shell-sand taken (not by himself) in the Channel Islands. Some doubt naturally arose in our minds from the circumstance of the alleged locality being one of the three hot-beds (Weymouth, Dunbar, Guernsey) for spurious species; but the independent dredging of the top whorls of a second individual by Mr. Barlee, sets the question of indigenousness at rest. We know no described species to which we can positively refer it; its characteristics, however, agree tolerably with the too succinct diagnosis of *C. angustissimum* (Brit. Associat. Report, 1843, p. 190), an Ægean shell, of which the types are not at present accessible. The apex and mouth are imperfect in both examples; we must content ourselves then with enumerating the few perceptible features, and calling the attention of collectors to the subject.

Shell turreted-cylindraceous, very slenderly tapering, whitish with an orange-brown sutural line. Whorls about eight (in the specimen), rather high, peculiarly constricted at the suture, so that the central area seems swollen; coarsely cancellated by spiral and longitudinal cords, the lattices formed by which are decidedly broader than long; spiral cords four on the principal turns. Pillar orange-brown. Length rather more than a fifth of an inch.

Vol. iii. p. 220. ACLIS SUPRANITIDA.

We cannot determine from the description, avowedly taken from an immature specimen, to what the *Turbonilla reticulata* of Macgillivray (Moll. Aberd. p. 327) should be referred. The synonyms indicate *Cerithium reticulatum*, but the characteristics mentioned (rounded whorls, and an umbilicus) scarcely permit this conclusion. An excellent conchologist who has examined the specimen, declares it to be a young *Aclis:* but the expressions "reddish brown," and "ridges crossed by transverse grooves," are against this hypothesis.

Aclis supranitida was taken alive by Mr. Hanley in Guernsey this summer. It is entirely white, except the jet black eyes which are placed far back, sessile and rather distant. It has no true muzzle. The tentacles are subulate and truncated. The tail is simple and obtuse. There are short lateral lobes. We have figured the head of this animal in Plate MM. fig. 5.

Vol. iii. p. 222. ACLIS UNICA.

Mr. Barlee has sent us a broken specimen, which agrees with this species in most particulars; the ribs, however, are rather more elevated than usual, and the spiral lines almost entirely obsolete. It may possibly prove, however, a distinct species.

Vol. iii. p. 231. EULIMA POLITA.

The *nitida* here spoken of is that which was indicated but not described by W. Thompson, in the Annals of Natural History, New Series, Vol. iii. p. 352.

Vol. iii. p. 239. On CHEMNITZIA, ODOSTOMIA, and EULIMELLA.

It is requisite to notice the elaborate papers* by Mr. Clark, on the *Chemnitzia*, which are of high interest in a malacological point of view. In his last paper (Sept., 1852) he has abandoned many of his earlier and rasher assertions, so that his present views of species are not so utterly at variance with our own impressions. His guesses at truth (for they are no more, inasmuch as he had rarely the advantage of seeing the types, but only certain shells belonging to Mr. Barlee, which he considered such) coincide oftentimes with our own conjectures; our rule, however, has ever been to admit all published species as veritable ones, unless we could discover direct proofs to the contrary. Mr. Jeffreys' monograph of the group, served as a basis for our own, because we knew of the extreme pains lavished by that most truthful naturalist upon his subject, and we determined not to repudiate any of his supposed species upon slight grounds of dissent. We shall now enumerate the changes determined upon by him; but neither acquiesce in nor dissent from conclusions at which we are sometimes a little astonished.

---

* Ann. Nat. Hist., new ser. 1851, 1852.

Ch. formosa is ascribed as a variety to *rufa* proper.

Ch. rufescens is considered a variety of *scalaris.*

Ch. clathrata is regarded as a variety of *indistincta.*

O. conspicua, and not improbably *O. striolata*, are supposed to be forms of *acuta*, to which the *O. turrita* of Hanley (*unidentata, var. turrita* of the present work) is also referred. The name *turrita*, be it remarked, was published long before *acuta.*

O. dubia, *alba*, *nitida*, *Rissoides*, *Eulimoides*, and *glabrata!* are all called *C. pallida*, and we are declared to have stated that Montagu's type of *Turbo pallidus* was not positively his own specimen.

O. truncatula is said to be an adult *nivosa.*

Eulimella affinis is stated to be specifically identical with *E. acicula.*

In the descriptions of the animals of *Odostomia*, cited from Mr. Clark, the " mentum " is often described as a muzzle.

Mr. Clark holds with Mr. Jeffreys that these three groups constitute but a single genus. We have considered them distinct, but are ready to degrade them to the rank of sub-divisions, should future researches on their organization and distribution both geographical and chronological, support the belief in their unity as a natural alliance. Mr. Alder would keep *Odostomia* and *Chemnitzia* apart, but unite *Eulimella* with the latter.

Vol. iii. p. 242. CHEMNITZIA ELEGANTISSIMA.

Mr. Clark has given a full description of the animal of this species in the "Annals of Natural History," for August, 1851. He also describes that of the form *pusilla*, which would appear to have strong claims to specific distinction. Its foot is longer (than that of *elegantissima*) and is acute behind (not obtuse as in the allied form)." In *pusilla* the tentacula "when spread have their membranes united to the extremities, which are minute and pointed, so that they appear in action a single united leaf: in its congener they are more triangular, less, though greatly, membranous, and do not unite above half their length, and have very obtuse terminations. The *C. pusilla* has a palish purple streak on each tentaculum and on each side the rostrum" (*i.e.* mentum) "in the *C. elegantissima* both the parts are hyaline-white."

The shell differs very little from the typical *elegantissima*, and although long identified with the *gracilis* and *pusilla* of Philippi, has hitherto been regarded as its dwarf variety. It is both smaller and more slender, and has rarely more than nine or ten volutions, which are much flattened.

In some individuals the whorls are high in proportion to their breadth, the suture strongly marked, and the ribs, which are not at all sinuated nor arched (for the most part they are slightly so in *elegantissima* proper) are so closely packed, that their intervals are mere grooves; these peculiarities, however, are not present in others.

The examples forwarded by Mr. Clark having been compared with the specimen of *gracilis* received from Philippi cannot be distinguished from it; in others, he writes us word, he can trace the spiral striæ (or rather what Philippi took for them, as he observes) mentioned as present in that species; he considers that both form but one species, for which he prefers the name *pusilla*.

Of our British synonyms of *elegantissima*, that of Fleming probably belongs to this shell; but almost all our English writers have included both forms under one appellation.

The *Turbo albus* of Pennant (Brit. Zool. ed. 4, vol. iv. p. 13, pl. 79, fig. below central group) was apparently a *Chemnitzia*, and probably the *elegantissima* of authors. The figure is too bad, and the description, "with eight spires, striated transversely (longitudinally) white" too succinct for positive identification.

Vol. iii. p. 245. CHEMNITZIA RUFA and FULVOCINCTA.

An acquaintance with the animals of both these shells enables us at length to declare their specific distinctness; on this one point we can accord with the views expressed by Mr. Clark in one of his many papers on the *Chemnitziæ*.

The *C. rufa* of our work must, consequently, be thus divided.

C. RUFA, Philippi.

Plate XCIII. fig. 4.

Reddish; if banded, the band immediately beneath the sutures; whorls flat; suture deep; ribs straight, bluntish, their intervals distinctly and rather broadly grooved in a spiral direction.

Melania and *Chemnitzia rufa*, PHILIPPI.
Parthenia crenata, LOWE.
Pyramis crenatus, BROWN.
Odostomia rufa, in part, JEFFREYS.
Chemnitzia rufa, southern form, British Moll. p. 247.

Found chiefly in Devonshire (Clark); Dorsetshire (S. H.); and the S. W. coast of England, in not very deep water.

C. FULVOCINCTA, Thompson.

Plate XCIII. fig. 3, and F F. fig. 4, as *rufa*.

White with a single sub-central orange spiral fillet; whorls flattish, yet a little rounded below; suture simple though distinct; ribs not oblique, yet a little sinuated, their intervals rather finely grooved in a spiral direction.

Turritella fulvocincta, THOMPSON, and Brit. Marine Conch.
Turbonilla rufa (by typographical error in our synonymy as *T. crenata*) LOVÉN.
Chemnitzia fulvocincta, ALDER.
Odostomia rufa in part, JEFFREYS.
Chemnitzia rufa, northern form, British Moll. iii. p. 246.

A deep water species, for the most part; dredged chiefly in Scotland, Ireland, and the North of England.

The *C. simillima* cannot safely be referred to either; indeed the known character of Laskey throws great doubts upon its indigenousness.

Vol. iii. p. 249. CHEMNITZIA FENESTRATA.

Mr. Clark has taken this fine species alive in ten fathoms water, six or seven miles from land, off Exmouth. The animal has comparatively long, slender tentacula with white inflated tips. The black eyes are close together at the inner bases of the tentacles. The "rostrum is slender, long, flat, barely hollowed out at its termination." The foot is short, broad, and white, but capable of much attenuation; its anterior angles are very moderately auricled. The operculum is corneous, pyriform, and obliquely striated.

Mr. Clark, in the same paper in which his account of the above-noted animals is contained (Annals of Nat. Hist. Sept. 1852), describes those of certain other *Chemnitziæ*, and allied mollusks, under which, however, he includes so many forms that it is not always clear to which species (or variety, as he would have it) his description rightly applies. Among these is one which he refers at once to *Chemnitzia indistincta* and *C. clathrata*. This animal is yellowish white, with snowy specks. It has very short tentacles, broad and subtriangular, often speckled with yellow, and having their eyes at their inner bases. The foot is largely auricled in front. The operculum is pyriform.

Vol. iii. p. 252. CHEMNITZIA SCALARIS.

The animal of specimens taken by Mr. Clark in ten fathoms water off Teignmouth was white (sometimes of a pale red muddy brown) speckled with opaque white points; the mentum deeply notched in front; the tentacula moderately long, strong and divergent; the eyes black, not very close together; the foot short and slightly auricled.

Torquay in S. Devon is also a locality for this rare shell.

Vol. iii. p. 255. CHEMNITZIA INDISTINCTA.

To this species, Mr. Jeffreys in his interesting monograph of the British *Odostomiæ* has referred the *Rissoa Balliæ* of Thompson (Annals Nat. Hist. Vol. v. p. 98, pl. 2, f. 9), stated to have been found at Youghal in Ireland by Miss M. Ball. The specimen having been lost, we cannot verify the correctness of the identification; we know, however, of no other indigenous shell to which it could be referred, and the delineation is not at all unlike some of the varieties of that variable species. The description runs thus,—"elongated, white, apex obtuse, five slightly rounded whorls, deeply marked longitudinally with somewhat distant striæ, aperture ovate, margin of the mouth thin, lower portion of the first whorl spirally striated. Length a line and a half. Although of a more slender form, this species, in sculpture, &c., somewhat resembles *Odostomia spiralis*, but is a true *Rissoa*."

Vol. iii. p. 259. CHEMNITZIA EXIMIA, Jeffreys.

With not very numerous longitudinal ribs, that are clathrated by two or three spiral lyræ on the principal turns; whorls more or less rounded, not excavated above the suture; fold quite obsolete.

Plate XC. fig. 1, as *Rissoa eximia*.

Rissoa eximia, JEFFREYS, Annals Nat. Hist. new ser. (1849) vol. iv. p. 299.
Chemnitzia Barleei, CLARK, Annals Nat. Hist. new ser. vol. vii. (1851) p. 129.

So few examples of this minute shell, whose sculpture approaches very closely to that of *O. excavata* have reached us, that we neither feel positive as to their maturity, nor certain as to their genus: from the obliquity of the nucleus, we have provisionally attached the species to those of the present group.

The shell is of an oblong-subturreted shape, moderately thin, but not transparent, and of an uniform whitish hue. The spire, which scarcely exceeds the body in length, is composed of three whorls and a half, that are profoundly separated by a not much slanting suture, and terminate in a large blunt rather obliquely disposed prominent nucleus; they are ventricose, obtusely subscalariform of rather fast longitudinal increase, and of moderate height (the dorsal length of the penult being to the breadth of it as three to five). The sculpture consists, upon the penult and preceding turn, for the first coil and a half do not exhibit any, of either narrow prominent and distant, or broad depressed and approximate, yet never very numerous, perpendicular ribs, whose intervals are clathrated by two spiral costellar lines, that wind along the lower half of each whorl. A third revolving line succeeds them upon the rather narrow body-whorl, beyond which the ribs, that finally become rather more closely disposed, extend some little distance; the base itself, however, is smooth, or almost so (always devoid, at least, of spiral striation), and is rounded yet rather quick in its declination. The mouth, which occupies two-fifths, at least, of the entire length, is simply ovate; it is not distinguished by any peculiar markings. The outer lip is thin, simple, arcuated, and moderately projecting; it neither expands, nor does it advance much at the base, where there seems occasionally a slight disposition to effusion. The curved pillar lip, which is acute and rather elongated, curls very slightly back, but is not reflected, nor furnished with a distinct fold. The axis is most minutely subperforated. The length of this minute shell is but a single line, which is about twice its extreme breadth. The discovery of this species is due to Mr. Barlee, who obtained it in the Zetland Islands.

Vol. iii. p. 276. ODOSTOMIA DUBIA.

This species was erroneously named *unidentata, var.* upon the plate (XCIV. fig. 8). We do not like the figure.

Vol. iii. p. 284. ODOSTOMIA RISSOIDES.

The animal is described by Mr. Clark in the "Annals of Natural History," for December, 1850. The tentacles are very short, broad, awl-shaped, bevelled and blunt, and are marked from base to point by an opaque linear stripe, besides a white dot at their tips. The eyes are large, black, and immersed at the internal bases of the tentacles. The foot is very short, truncate, and scarcely auricled in front, pointed (when on the march) behind.

The colour is white, speckled with sulphur yellow; it lives among algæ in the lower levels of the littoral zone.

Vol. iii. p. 289. ODOSTOMIA INSCULPTA.

The animal is opaque frosted white, with a rather large patch of dull claret red on the neck. The "rostrum" is short, closer to the eyes; with the segments arcuating as in *O. obliqua*. The tentacula coalesce at their bases, and are very broad and short; they terminate in very small white slightly inflated tips; the eyes are close together at their internal bases. The foot is bluntly auricled in front. The operculum is horn-coloured, narrow, and subelongated. This description is extracted from Mr. Clark's account of specimens taken on a shelly bottom in fourteen fathoms water, six miles from shore at Exmouth.

Vol. iii. p. 291. ODOSTOMIA OBLIQUA.

Taken alive in twelve fathoms, off Exmouth, by Mr. Clark. "The rostrum is short and cloven in the centre almost to the eyes. The tentacula are strong, rather long, subrotund and taper, terminating with minute circular snow-white spots or inflations on the tips; the eyes are close together at the internal basal angles; the great peculiarity attached to the tentacula is, that instead of a moderate divergence on each side of the rostrum, they form large arcuations, and are carried at right angles with the shell. The foot is rather concave in front, auricled long and broad. The operculum is elongated and narrow."

Vol. iii. p. 292. ODOSTOMIA WARRENII.

Mr. Clark has taken this species alive in fourteen fathoms water off Exmouth. "The rostrum is short cloven as far as the eyes, having the segments curved to the right and left; the tentacula are short, triangular, bevelled, not broad, attenuating to a fine point, and armed with small white inflated tips; the eyes are close together at the internal united bases. The foot is short, concave in front, slightly auricled, posteally terminating obtusely with a light, horny, thin, obliquely striated operculum, seated on a simple lobe that is scarce distinct from the upper part of the foot, at its junction with the body."

Vol. iii. p. 301. ODOSTOMIA DOLIOLIFORMIS.

The animal, according to Mr. Clark, is hyaline pale azure. It has longer and not so triangular tentacula than its congeners, nor are they furnished with such broad lateral membranes, nor do they coalesce so decidedly. They are tipped with flake white. The eyes are at their internal bases. The foot is short and broad, truncate anteriorly, and exhibits a curious trilobed appearance. This mollusk inhabits the littoral zone.

Vol. iii. p. 303. ODOSTOMIA DECUSSATA.

The animal, according to Mr. Clark, is hyaline white, except the mentum, which is pink and less lobed, though more truncate than in congeneric species. The tentacula are triangular and pointed, with coalescing lateral membranes. The eyes are elevated on minute prominences, and are very close together at the inner bases of the tentacula. This mollusk is not shy; it inhabits the circum-littoral belt, in twelve fathoms water, at Budleigh Salterton.

Vol. iii. p. 308. ODOSTOMIA GULSONÆ, Clark.

Plate CXXXII. fig. 6.

Chemnitzia Gulsonæ, CLARK, Ann. Nat. Hist. new ser. vol. vi. p. 459, and vol. viii. p. 108.—JEFFREYS, do. vol. vii. p. 27.

Shell thin, semitransparent, smooth, white, glossy, of a slender turreted form, subcylindrical in the middle, moderately tapering and blunt-topped above; with a peculiar lateral projection of the last whorl on the side of the mouth. Whorls from five to six, distinctly divided by a more or less slanting suture; rounded, or at least decidedly convex, of rather quick longitudinal increase, and somewhat high, the breadth in the penult volution being only about a fourth more than the length. The body occupies from one-third to nearly two-fifths of the entire length; it is rather abruptly broader than the preceding coil, and is produced at the base, where its surface is moderately rounded. The apical turn large, blunt, mammillary, and subheterostrophe. The mouth which is disposed to become effuse at the base, where there is a slight sinuation of the edge of the lip, is very ample, occupies two-thirds of the basal diameter, and from rather more than a third to almost two-fifths of the total length; its shape is subovate, being well rounded anteriorly, and but little contracted posteriorly. The expanded outer lip, which advances at the base, is greatly and continuously arcuated, and projects very remarkably beyond the general outline. The pillar lip is thin, elongated, somewhat narrowly reflected (forming an indistinct chink) and greatly arched, hence there is no angle formed at its basal junction with the outer lip. The extreme length does not much exceed a single line.

The animal has been described at length by Mr. Clark. It is white with black eyes, not very close together and surrounded by white circles, and has a very pale yellow foot. The tentacles are thick, broad, short, and rounded at their tips. The foot is very short, narrow, deeply bifurcated in front and obtuse behind. The operculum is suboval, and is bordered with brown.

This shell was discovered by Mrs. Gulson, who found it at Exmouth. Mr. Jeffreys has it from Sandwich and Weymouth, and Mr. Barlee has taken it at Falmouth, in Lerwick harbour among the Zetland Isles, and plentifully at the Arran Islands on the west coast of Ireland.

Mr. Barlee has dredged three or four specimens from Lerwick harbour, which very closely approach the present species, yet may possibly prove distinct. One alone seems mature or nearly so, and in that the outer lip is not so prominently expanded; yet judging from the lines of increase, it would eventually have become so; the form tapers more regularly (the difference between the breadth of the penult and antepenult turns being evident) the whorls slightly higher, the mouth not so oblique, and the chink more obscure.

Vol. i. p. 311. EULIMELLA.

Mr. Clark has observed the animals of *Eulimella acicula*, *affinis* (which he regards as a variety of the former species) and *clavula*.

The animal of *Eulimella acicula* is of a subpellucid frosty white hue, speckled with minute snowy flakes. The mentum (regarded by Mr. Clark as "the head or rostrum") is rather long, very broad, square in front, and slightly emarginate in the centre; it is grooved throughout the whole length, and the groove is continued towards the neck, just separating the tentacula at their basal centre; at its upper surface, close to the base, is the orifice of the proboscis. The tentacula diverge and resemble short broad, minute leaves, each with an opaque stripe down the centre. The eyes are not quite close to each other, and are placed a little behind the inner bases of the tentacula. The foot is rather long, extending to two volutions, bluntly auricled in front, pointed behind, and bears on a simple lobe a pyriform horny operculum.

Eulimella affinis exactly accords with the above description.

Eulimella clavula is of a clear frosted white hue. The mentum is very narrow, not bilobed or grooved. The tentacles are short, broad and phylliform; they are not divergent; each terminates in two white inflations. The eyes are at their internal bases, not very close together. The foot is strongly auricled. All these animals were taken in fourteen fathoms water off Teignmouth in Devon.

Vol. iii. p. 319. TRUNCATELLA MONTAGUI, and Note.

The obscure *Turbo nitidus* of Adams (Linnean Transact. vol. iii. p. 65), is referred by Montagu to this species. Some specimens of *H. subcylindrica*, once the property of the author of the "Testacea Britannica," prove, on comparison, to be identical with a Jamaica *Truncatella* sent us by Professor Adams, of Vermont, as his *T. succinea*.

Vol. iii. p. 376. Note to MUREX CORALLINUS.

To the *Murex gyrinus* of Montagu's description (Test. Brit. Suppl. p. 170, erroneously as of Gmelin; Turton, Conch. Diction.

p. 95) must also be referred the *Fusus gyrinus* of Fleming (Brit. Anim. p. 351.—Brit. Marine Conch. p. 205.—Brown, Ill. Conch. G. B. p. 8, not figured).

Vol. iii. p. 380. PURPURA LAPILLUS.

The experience of Mr. Albany Hancock is opposed to the observation of Mr. Spence Bate, that this mollusk does not bore through the epidermis of the mussel. The former of these excellent observers remarks that it is indifferent what epidermis or shell be opposed to its progress: and has obligingly sent us specimens which indubitably prove his case; an important point, since this is one of the strong facts against the notion of a solvent being the agent used in boring.

Vol. iii. p. 394. NASSA PYGMÆA.

Add to the synonym *Buccinum tuberculatum* a reference to FLEMING, Brit. Anim. p. 341.—Brit. Marine Conch. p. 219; both which descriptions are copied from Turton's Conchological Dictionary.

Vol. iii. p. 408. BUCCINUM DALEI.

Through the kindness of Mr. Howse, who obtained the specimen, and Mr. Alder, who examined it, we are enabled to give some notice of the soft parts of this most rare and interesting mollusk. "Its tongue differs," writes Mr. Alder, "from that of *Buccinum undatum*, as well as from those of the allied species of the genus *Fusus*, and makes a slight approach to that of *Mangelia*. It has a single plain and slightly-curved tooth on each side, and a very thin non-denticulated plate in the centre. The *Fusus* it comes nearest to is *F. Turtoni*, whose tongue I have also examined." In the sketch sent of the latter the curved lateral teeth are broader at the bases than the former, shorter, and have two small lobes or denticular processes at junction of the broad part with the hook at the inner side of the centre plate, which, as in the former, has no denticles.

"Mr. Howse got two or three specimens of *Buccinum Dalei* from the deep-water fishermen in this (the Northumbrian) coast. Two of them had the animal in, and one which was alive I had in my possession for a day or two, but the animal was in a very sickly state, and never showed itself out of the shell. It was of a pale flesh or salmon colour, without markings. Its form, which I have only had an opportunity of examining in spirits, does not appear to differ from that of *Buccinum undatum*, though the operculum, which is rather small, has an apical nucleus, in that respect resembling *Fusus* rather than *Buccinum*. The characters of the species are, upon the whole, rather anomalous."

Vol. iii. p. 410. BUCCINUM HUMPHREYSIANUM.

Plate CXXXIII. fig. 2.

The recent capture, by Mr. Barlee, of several living individuals of this species, in various stages of growth, enables us both to amend our former description, and to illustrate the species by a better engraving. Immature specimens (those with six volutions; the adult have seven at the least) which are excessively fragile, display the characteristic painting more vividly than the full-grown shells. The ground-colour of the shell ranges from pale fawn to light purplish chocolate, shaded lengthways with a more intense tint at the stages of increase, and, for the most part, irregularly flecked here and there with white. It is variegated also by several narrow fillets of a darker hue, which sometimes are interruptedly articulated by paler intervals : sometimes are simple spiral lines. These bands, which are not generally very clearly defined, and are usually about five in number upon the penult turn, are wont to be grouped upon the body whorl, so as to form two broad ribands, one near the anterior extremity, the other midway between the former and the suture.

Some of our specimens are more elongated than the one formerly delineated, and the spiral sulci are very decidedly narrower than the intervening spaces ; no vestige of longitudinal undulations is perceptible in any of them. The columella, which in the aged shell is pure white, and destitute of callosities or folds, is marked in those barely adult with a very oblique brown one ; it decidedly exceeds the posterior portion of the inner lip in length, and forms an obtuse angle with it; hence imparting a semi-rhomboidal aspect to the mouth. The emargination is very broad. The operculum is very small, and of a deep bright yellow on its inner surface.

Mr. Barlee took his specimens (some of them two inches in length), "abundant," north and east, thirty miles off Zetland. In the neighbourhood of the same islands he has taken *Fusus Berniciensis* (one of the examples four inches and a quarter long), *Mangelia purpurea, var. asperrima, Mangelia nana, Natica Helicoides,* and *Natica pusilla.*

Vol. iii. p. 449. MANGELIA.

Pennant's *Murex acuminatus* (Brit. Zool. ed. 4, vol. iv. p. 125, pl. 79, fig. 4 of central group?) is evidently a member of this genus, but too imperfectly defined* for identification.

Vol. iii. p. 512. CYLICHNA OBTUSA.

The *Bulla pertenuis* of Mighels (Boston Journal Nat. Hist., vol. iv. p. 346, pl. 16, f. 3,) so closely resembles the variety *Jeverensis*, that the difference is scarcely appreciable.

Mr. Byerley, of Birkenhead, having taken this species alive, communicated the animal to Mr. Alder, who writes to us respecting it.—"I find it is a true *Cylichna*, approaching much more nearly to *C. truncata* than to *C. cylindracea.* The head-disc is remarkably short, and has two lateral prominences standing up like ears; they are rounded, and do not terminate in points like those of *C. truncata.* I cannot perceive any eyes."

Montagu has referred to this species the *Bulla Regulbiensis* of Adams (Microscope, pl. 14, f. 28), an immature shell of doubtful parentage.

---

* Some of Pennant's figures are so bad that we have not ventured to cite them. His *Turbo lævis* (p. 130, pl. 79, top fig.) is an *Eulima*, but which species we cannot declare; his *Turbo duplicatus* (p. 129, pl. 81, f. 112) is perhaps *Turritella cincta*: his fluviatile *Helix lævigata* (p. 140, f. 139) probably a *Velutina.*

Vol. iii. p. 527. AKERA BULLATA.

The *Voluta Ionensis* of Pennant (Brit. Zool. ed. 4. vol. iv. p. 117, pl. 71, f. 87), should probably be referred to this species. Mr. Barlee has taken this shell recently at Zetland.

Vol. iii. p. 541. PHILINE QUADRATA.

The sculpture of this species, which we have lately received from Massachusetts, as the *P. formosa* of Stimpson, is very variable. In some of our younger specimens, the surface is merely traversed in a spiral direction by curly striæ (the curls short and numerous) with an occasional simple or scarcely undulating stria intervening. As these curly lines, in approaching the lip, run farther apart from each other, the spaces become filled by a similar series of striæ, which form engraved ovals (for the most part linked together) by their contact with the preceding set. The upper or posterior spiral rows are rather impressed dots than *catenæ.*

Vol. iii. p. 609. ANTIOPA SPLENDIDA.

In a very interesting paper on the anatomy of this beautiful Nudibranch, published in the "Annals of Natural History," for July, 1851, Mr. Albany Hancock has identified the species with the *Eolidia cristata* of Delle Chiaje, and *Janus Spinolæ* of Verany. The specific name will stand as *cristata.*

Vol. iv. p. 9. ARION FLAVUS.

Mr. E. J. Lowe has obligingly communicated to us living specimens of this rare species from the neighbourhood of Nottingham. He remarks that, "it never appears on the surface even in rainy or damp weather. It is mostly under very damp leaves, although occasionally found in shady woods, under the lichen, *Peltidea canina,* and among the fungus of *Nidularia striata,* but when found it is quite imbedded in these plants. It is capable of suspending itself by a mucous thread of strong substance."

Vol. iv. p. 13. LIMAX AGRESTIS.

There is much confusion in Turton's notices and figures of the shell of this common slug. His animal is *agrestis*, his description of the shell that of either *agrestis* or *Sowerbii*, whilst his figure was copied from Brard's, Plate iv. Fig. 8, *concava*. As the latter is declared by its describer to be truly the shell of *agrestis*, the synonymy should stand thus :

Limacella obliqua, BRARD, p. 118, pl. 4, f. 5, 6, 13, 14, 17.
Limacellus obliquus, TURTON, p. 26 (pl. 3, fig. 16, as *variegatus*).

Mr. R. Gibbs has found a curious monster of this species, having the upper tentacula united into one.

Vol. iv. p. 17. LIMAX ARBORUM.

This species appears to be very generally distributed. We found it plentifully in September, 1852, creeping on bare stones and rocks at an elevation of above fifteen hundred feet, near Connor Cliffs, above Dingle, in Kerry. The locality is worthy of record, as being entirely devoid of trees. Mr. E. J. Lowe observes, that near Nottingham it prefers walnut trees. The same active observer has found a curious pigmy variety of the scarce *Limax brunneus* near Nottingham.

Vol. iv. p. 19. LIMAX FLAVUS.

Although the shell described by Turton seems to be truly that of this species, his figure is copied from Brard's *obliquus* (pl. iv., f. 6), which is really *agrestis;* the synonymy would stand better thus :—

Limacella unguiculus, BRARD, p. 115, pl. 4, f. 14, 12, 3, 4.
Limacellus variegatus, TURTON, p. 25 (shell), fig. 15, as *unguiculus*.

It is just possible that Turton's description of the animal of *flavus* may refer to *Sowerbii ;* the figures of *Limacella concava*, BRARD, p. 121, pl. 4, f. 7, 8, 16, 17, 18 (copied as *Limacellus obliquus*, by Turton, fig. 17), may belong to *Limax gagates*, or even *L. brunneus*.

Vol. iv. p. 24. LIMAX GAGATES.

Mr. R. Gibbs has taken this rare slug, as well as *Limax carinatus* and *L. arborum*, plentifully at Sandown, Isle of Wight. *Zonites excavatus* was found in the same neighbourhood.

Vol. iv. p. 57. HELIX VIRGATA.

The larger individuals are often obtusely keeled. A very pretty brownish buff-coloured variety is obtained in Guernsey, that has the principal or peripheral band interrupted, and those below it more or less confluent, or even partially obsolete.

Vol. ix. p. 71, 77. HELIX SERICEA and H. FUSCA.

The original figures not proving satisfactory, the shells are again delineated at Plate CXXXII., fig. 9, 10.

Vol. iv. p. 100. PUPA ANGLICA.

The discoverer of this shell was not Mr. Miller, but Mr. Bean of Scarborough, whose services to British Conchology are so numerous, that, in their multiplicity, we fear we have overlooked them more than once.

Vol. iv. p. 130. ACHATINA ACICULA.

To this species must be referred likewise, the *Buccinum longiusculum*, of Jacobs (ADAMS, Microsc. pl. 14. f. 26, from WALKER, Test. Minut. f. 60.—*Jaminia longiuscula*, BROWN, Ill. Conch. G. B. p. 22, pl. 8, f. 8).

Vol. iv. p. 162. PLANORBIS LACUSTRIS.

Mr. Barlee informs us that this pretty and local shell has been found most abundantly by Mr. Bridgman, of Norwich, in streams running into the Norwich river. Mr. Barlee has taken *Planorbis glaber* and *P. nautileus* in the Zetland islands.

Vol. iv. p. 184. LIMNÆUS INVOLUTUS.

Add, Plate CXXXII. f. 12.

Vol. iv. p. 204. ACME LINEATA.

This rare shell has been added to the Scottish fauna by Mr. Barlee, who has taken it at Inverary, and in the Isle of Skye.

(ADDITIONAL FAMILY.)

PHYLLIDIDÆ.

This family formed part of the order of *Infero-branchiata* in the arrangement of Cuvier, and has its place alongside of the *Pleurobranchidæ* (vol. iii. p. 557), from the members of which group, among other characters, the mollusks composing it differ materially in being provided with branchiæ at both sides, and in not being furnished with any shell, either internal or external.

DIPHYLLIDIA, Cuvier.

Animal oblong, fleshy, covered with an ample mantle, under the borders of which the obliquely lamellated branchiæ extend along the two hinder thirds of the body. Head with minute tentacles and a lobe-like veil. Vent at the right side behind the reproductive orifice.

D. LINEATA, Otto.

Plate K K K, fig. 1–3.

Diphyllidea lineata, OTTO, Nov. Act. Acad. Leop. Nat. Cur. v. x, p. 121, pl. 7, f. 1.—PHILIPPI, Enum. Moll. Sic. v. ii., p. 82.

,, *Neapolitana*, DELLE CHIAJE, Mem. v. i., p. 128, pl. 10, f. 12 (fide Philippi).

Through the kindness of Mr. Albany Hancock we are enabled to give representations of this rare and interesting addition to the British fauna. The first British specimen was dredged off the Shetland Islands by Mr. Barlee in 1849. A second example has been taken by the Rev. R. C. Abbes, from the boats at Whitburn, which place is in the county of Durham, not in Northumberland, as we have on several occasions stated in the preceding pages. The animal found by Mr. Barlee measured less than one inch in length. It has been carefully compared by Mr. Hancock with specimens of the true *D. lineata*, and found to be identical.

Philippi describes the Mediterranean animal as having the body rounded in front, narrowed behind the middle, and acuminated at the posterior extremity. The foot is similarly shaped and fleshy ; it exhibits a distinct glandular space behind. Under the edge of the mantle are numerous lamelliform fuscous branchiæ. The capital veil is fleshy and tinged with crimson. Between it and the foot is the longitudinal orifice of the mouth, surrounded by plicated lips. Between the veil and the mantle there is a conical fleshy process, with minute clavate tentacles lodged in deep grooves, and never protruded by the living animal.

In the " Synopsis of the Mollusca of Great Britain," published in 1852, from the manuscripts of Dr. Leach, there occurs at p. 365, the following account of a mollusk, which has not been noticed by ourselves or any other recent observers in the British seas, but of the authenticity of whose presence we entertain not the slightest doubt.

CLIO, LAMARCK.

" The body is naked, gelatinous, oblong turbinated, and formed for swimming. The head is exserted, laden with many minute retractile tentacles, arranged into two bundles. Two eyes are situated on the upper part of the head. The mouth is terminal. Two branchial oblong-ovate fins are situated opposite each other on the sides of the neck. The aperture named the anus, and that of the organs of generation are situated beneath the fin, on the left side of the body."

C. BOREALIS, Pallas.

Clio Borealis, PALLAS, Spicil. Zool. 10, p. 28, t. i. f. 3—4.—BRUG. Encycl. Method. pl. 75, f. 3—4; Lam. Hist. Nat. des Anim. sans Vert. vii. 288; CUV. Reg. Anim. ii. p. 379.—LEACH, Ross, Voyage to Baff. Bay, Suppl.

,, *retusa*, FABR. Faun. Grœn. p. 334, no. 324.

,, *limacina*, Phipps; C. ELLIS, Zooph. p. 15, no. 324.

"This species is extremely common in the northern seas, and forms the principal food of the cetaceous animals. In 1811, during a tour made by me to the Orkneys with some friends, I observed on the rocks on that side of the Isle of Staffa, several mutilated specimens of this animal; the three previous days had been extremely stormy, so as to confine us to the Isle Colunsa. Some days afterwards I borrowed from a fisherman a large shrimp-net; and on rowing along the coast of Mull, when the sea was calm, after many vain efforts I was at last enabled to capture one of them alive. This specimen is in that part of the Zoological Collection which I presented to the British Museum."

The work from which the above extract is taken, and which appeared just as the last sheet of our last number was passing through the press, demands from us more than a passing notice. To a synonymy already overburthened, it adds an awful accumulation of names, which, although invented by Dr. Leach, more than thirty years ago, can only take date from December 1852, the year in which they are published, with descriptions attached. Mr. Gray sends forth this work as an act of duty and justice towards his distinguished friend and master. There will be many doubts in the minds of naturalists as to the good policy of the act, and whether it can be regarded as one of either justice to Leach, or justice to science. The eminent author of the manuscripts thus issued was, unquestionably, a man of brilliant genius, and, in many respects, in advance of his time. It would be unfair to judge of his merits by this "Synopsis of the Mollusca of Great Britain," a portion only of which appears to have been revised for the press. It is scarcely fair to send forth these undigested pages, containing such manifest experiments on the constitution of generic groups, that more than once we find the same species figuring in two genera with the same references in each instance! It is a most disappointing book. Trusting to the traditional fame of Leach, as a malacologist, we had expected to find that when reasons were undiscoverable in the shells only, there were good ones derived from observations on the soft parts, or anatomical researches, for the numerous genera, the names of which are preserved in cabinets, or ticketed, to the perplexing of beginners, on specimens in the British Museum. We had imagined to ourselves sound though occult reasons weighing in the mind of Mr. Gray, when he so often adopted these mysterious appellations in preference to the terms of published nomenclature. Greatly were we surprised to find, now the murder is out, that Leach constituted these genera on trivial distinctions, exhibited by the shells only! The strangest combinations result, and animals that are *toto cœlo* distinct, are bound together by almost imperceptible links. Let any zoologist turn to Leach's family of *Turbonidæ*, and see if our censure be not far too mild. The descriptions of the species are vague, meagre, and poor indeed, and for this there could be no excuse, since the accurate and perspicuous Montagu had already written to serve as a model. But far more censurable than these errors of judgment is the unaccountable recklessness with which new names are given to well-known and well-named species, without the shadow of a reason why; and, except in very rare instances, without an apology for the proceeding. The supposed new species that are described, unless traditionally known, are undiscoverable, and most of them must remain so. So far as the *Tunicata* and *Nudibranchiata* are concerned, little harm will be done, since in these cases the work will be treated as so much dead letter. But injudicious collectors and curators may be tempted, from the love of change or the vanity of differing from accepted usage, to make use of Leach's nomenclature. To prevent mischief as much as possible, we append, in default of editorial notes, a concordance for the testacea. If we have been severe in these comments, it is because we feel compelled reluctantly to protest. At the same time we must express our belief, that, with matured thought and better health, the work would have been sent forth by its author in a very different shape.

THE following Concordance of Leach's nomenclature, is drawn up almost entirely from the synonymy; the descriptions being utterly insufficient for the determination of species. The naked mollusks are not included in it.

Cleantus Montagui (pl. 7, f. 6, 7) = Pleurobranchus plumula.
Oscanius argentatus — Pleurobranchus membranaceus.
Aplysia varians — A. hybrida.
Esmia Griffithsiana (pl. 7, f. 8, 9, 10) — Aplysia hybrida junior?
Marsenia producta — Lamellaria perspicua...M. complanata — L. tentaculata.
Bullæa Planciana — Philine aperta...B. catena — P. catena.
Scaphander lignarius — S. lignarius...S. catenatus — S. lignarius, var. (from desc.)...S. Brownii — ?
Haminæa Cuvieri — Bulla hydatis...H. dilatata — B. hydatis (monstrous)?...H. elegans — B. (exotic).
Eucampe Donovani — Akera bullata.
Roxania Cranchii (pl. 7, f. 11) — Bulla Cranchii.
Succinea Mülleri — S. putris.
Vitrina Drapernaldi — V. pellucida.
Helix aspersa — H. aspersa.
Tachea nemoralis, T. hortensis — Helix nemoralis.
Arianta arbustorum — Helix arbustorum.
Pomatia antiquorum — Helix pomatia.
Teba cingenda — Helix Pisana...T. virgata — H. virgata...T. Cantiana — H. Cantiana...T. Carthusianella (pl. 8, f. 4, 5, 6) — H. Carthusiana. T. rufescens — H. rufescens...T. caperata — H. caperata...T. hispida — Helix sericea...T. fulva — H. fulva...T. spinulosa — H. aculeata.
Zonites ericetorum — Helix ericetorum...Z. radiata — H. rotundata...Z. rupestris — H. umbilicata...Z. lucida — Z. cellarius, &c...Z. crystallina — Z. crystallinus.
Chilotrema lapicida — Helix lapicida.
Zurama pulchella — Helix pulchella.
Elismia fasciata — Bulimus acutus.
Ena montana — Bulimus Lackhamensis...E. obscura — B. obscurus.
Zua lubrica — Z. lubrica.
Balæa fragilis — Balea fragilis.
Clausilia lamellata — C. laminata...C. Rolphii (pl. 8, f. 7) — C. plicatula...C. biplicata — C. biplicata...C. rugosa — C. nigricans.
Azeca Matoni (pl. 8, f. 8, 9) — A. tridens.
Abida secale — Pupa secale.

Pupilla Drapernaudii = Pupa umbilicata...Pupilla marginata — Pupa muscorum.

Vertigo palustris (pl. 8, f. 10) — Pupa antivertigo...V. vulgaris — P. pygmæa...V. heterostropha — P. Venetzii (probably).

Carychium minimum — C. minimum.

Jaminia bidentata — Conovulus bidentatus.

Alexia denticulata — Conovulus denticulatus.

Stagnicola octanfracta — Limnæus glaber...S. communis — L. palustris. ...S. minuta — L. truncatulus...S. elegans—L. stagnalis var. fragilis. ...S. vulgaris — L. stagnalis.

Gulnaria peregra — Limnæus pereger...G. lacustris — L. Burnetti, or pereger, var....G. auricularia — L. auricularius.

Myxas Mülleri — Limnæus glutinosus.

Physa fontinalis — P. fontinalis.

Nauta hypnorum — Physa hypnorum.

Planorbis corneus — P. corneus...P. albus — P. albus...P. carinatus — P. carinatus...P. marginatus, P. Sheppardi — P. marginatus...P. imbricatus — P. nautileus...P. contortus — P. contortus...P. vortex — P. vortex...P. spirorbis — P. spirorbis.

Hemithalamus nitidus — Planorbis lacustris.

Ancylus lacustris — A. oblongus...A. fluviatilis — A. fluviatilis.

Iodes angulatus — Ianthina communis...Iodes Norrisii — I. ? (no desc.)

Cypræa Europæa — C. Europæa.

Simia Pennantiana — Ovula patula.

Marginella Anglica — M. lævis.

Actæon tornatilis — Tornatella fasciata.

Ocinebra erinaceus — Murex erinaceus.

Purpura lapillus — P. lapillus.

Hima minuta — Nassa incrassata...H. reticulata — N. reticulata...H. lævigata (pl. 10, f. 1) — Planaxis Brasiliensis (exotic).

Buccinum Puxleianum — B. Humphreysianum ?...B. undatum — B. undatum...B. antiquum — Fusus antiquus...B. corneum — F. Islandicus...B. Bamffium — Trophon clathratus...B. turricula — Mangelia turricula.

Fusus muricatus — Trophon muricatus...F. asperrimus — Mangelia purpurea, var. asperrima.

Mangelia gracilis — M. gracilis...M. purpurea — M. purpurea...M. elegans — M. linearis...M. Cranchiana — M. linearis ? ? var....M. Pennantiana — M. costata...M. Goodalliana — M. striolata...M. lineata (pl. 10, f. 2) — M. multilineata (exotic)...M. minima — Lachesis minima.

Bela nebula — Mangelia nebula, var. lævigata...B. rufa — M. rufa, or var. last...B. Cranchiana — M. rufa var. (probably)...B. minima —

M. rufa var. ?...B. septangularis = M. septangularis...B. attenuata — M. attenuata...B. accincta — M. accincta (exotic).

Aporrhais pespelecani — A. pespelecani.

Cerithium reticulatum — C. reticulatum...C. tuberculare — Cerithiopsis tubercularis...C. subulatum — Cerithium subulatum ?...C. adversum — C. adversum...C. Spencerianum — Chemnitzia ?...C. elegantissimum — C. elegantissima (scarcely so from desc.).

Sabanæa eburnea — Rissoa ventrosa...S. ventricosa — Lacuna crassior ? ...S. rubra — Rissoa rubra (probably)...S. interrupta — R. parva, var. ...S. vittata — R. cingillus...S. Montaguana — Odostomia unidentata ? ...S. plicata — O. plicata...S. unifasciata — Rissoa rubra, var. ?...S. ulvæ — R. ulvæ...S. paucicostata — R. ?...S. Binghamiana — R. parva, var. ?

Assiminia Grayana (pl. 9, f. 4, 5) — A. Grayana.

Scalaria clathrus (pl. 9, f. 8) — S. communis...S. Turtoniana (pl. 9, f. 9) S. Turtonis...S. Trevelyana (pl. 9, f. 10) — S. Trevelyana...S. clathratula — S. clathratula.

Turritella terebra — T. communis...T. elegantissima — Chemnitzia elegantissima (again, from synonyms) (? C. rufa from description)...T. Clelandiana — Aclis unica...T. nitidissima — A. nitidissima...T. vitrea — Rissoa vitrea...T. Dorvilleana — R. punctura...T. eburnea — R. ? ?...T. nivea — R. proxima ?...T. nitida — Odostomia truncatula ? ?...T. Danmoniensis — Chemnitzia ? fenestrata ?

Turbonella Hibernica — Odostomia spiralis ?...T. Montaguana — Chemnitzia ? indistincta ?...T. costata — Rissoa costata...T. decussata — Odostomia decussata...T. striata — Rissoa striata...T. pallida — Odostomia pallida...T. transparens — O. ? ?...T. angusta — O. ? ...T. nivosa — O. nivosa...T. vitrea — Rissoa vitrea (again from synonyms).

Alvania striata — Rissoa striata (again from synonyms, but not so from generic description)...A. glabra — ? ?...(Aclis from definition) A. costata — R. costata (again from synonyms not so from desc.)...A. Cranchiana — ? ?

Zippora Drummondi (pl. 9, f. 11) — Rissoa auriscalpium, probably (exotic).

Trochus papillosus — T. granulatus...T. Cranchianus — T. ?...T. Clelandianus — T. millegranus ?...T. ziziphinus — T. zizyphinus...T. irregularis — T. ?...T. discrepans — T. zizyphinus (monster).

Montagua Danmoniensis (? plate 9, f. 2) — Trochus ? Montagui ?

Neptheusa crassa — Trochus lineatus.

Gibbula tumida — Trochus tumidus...G. lineata — T. umbilicatus ?...G. magus — T. magus

Natica glaucina — N. monilifera...N. Lamarckiana — N. Alderi ?...N. Browniana — Narica (exotic).

Nerita littoralis — Littorina littoralis.

Neritina Europæa = N. fluviatilis.

Temina pallidula — Lacuna pallidula ... T. Turtoniana, T. rufa — L. puteolus...T. variabilis (pl. 9, f. 1) — L. puteolus (from figure).

Turbo littoreus — Littorina littorea...T. sulcatus (pl. 9, f. 6) — L. rudis, var....T. rudis — L. rudis...T. tenebrosus — L. rudis, var. tenebrosa...T. petricola — L. Neritoides...T. striatula — Rissoa striatula (not from descr.).

Persephona rufilabris — Rissoa costata of Lamarck, probably (exotic) ...P. Scotica — R ?...P. Goodalliana — R. rufilabrum ?...P. calathiscus — R. calathiscus (exotic)...P. punctata — R. Beanii ?...P. Zetlandica — R. Zetlandica...P. Hutchinsiana R. — crenulata ?...P. brevis — R. striatula ?

Epheria Bulweriana — Lacuna ? ?...E. vincta (? the E. Goodalli of pl. 9, f. 3), E. quadrifasciata — L. vincta.

Zacanthusa reticulata — Rissoa Beanii ?...Z. semicostata — R. striata young (from syn. only).

Lamarckia costata — Rissoa labiosa.

Medoria Walkeri — Lacuna crassior...M. Danmoniensis — ?...M. tenebrosa — Littorina rudis, var. tenebrosa (again, from synonyms).

Margarites diaphana (pl. 9, f. 7) — Trochus (Margarita) Helicinus.

Zeanoe nitida — Truncatella Montagui, probably (or exotic).

Glaucothoe Montaguana — young of last from synonymy, not description ; Odostomia truncatula ?

Eudora varians — Phasianella pullus.

Balcis lævis — Eulima polita...B. testacea — E. subulata ?...B. arcuata — E. distorta ? ?

Cyclostoma elegans — Cyclostoma elegans.

Valvata Mülleri — V. cristata...V. fontinalis — V. piscinalis.

Paludina vulgaris — P. Listeri (from synonyms, not description)...P. achatina — P. vivipara (from synonyms, not description).

Bithynia jaculator — B. tentaculata...B. Leachii — B. Leachii...B. inflata — ?

Fissurella Græca — F. reticulata.

Cemoria Montaguana (pl. 10, f. 6) — Fissurella reticulata (young)... C. Flemingiana (pl. 101, f. 4, 5) — C. Noachina.

Emarginula vulgaris — E. reticulata...E. rosea — E. rosea.

Capulus Hungaricus — Pileopsis Hungaricus.

Mitella Sinensis — Calyptræa Sinensis.

Patella vulgata — P. vulgata...P. parva — Acmæa virginea... P. Clelandiana — A. testudinalis.

Patina lævis and pellucida — Patella pellucida.

Lepidopleurus albus — Chiton albus ?...L. punctulatus (? as Chiton punctatus, pl. 10, f. 7=C. lævis), L. carinatus — Chiton ?

Acanthochætes vulgaris (pl. 10, f. 8) — Chiton fascicularis.

Chiton cinereus = C. asellus...C. Flemingianus — C. lævis ?...C. ruber — C. ?...C. Cranchianus — C. ?...C. tuberculatus — C. ?...C. fuscatus — C. cinereus ? ?...C. lævis — C. ruber ? (lævis from syn.)...C. latus — C. ?...C. Scoticus — C. ?...C. variegatus — C. cinereus (probably).

Pholas dactylus — P. dactylus.

Zirphæa crispata — Pholas crispata.

Anchomasa Pennantiana — Pholas parva.

Cadmusia Solanderia (pl. 11) — Pholadidea papyracea.

Barnia candida — Pholas candida.

Gastrochæna Modiolina — G. Modiolina.

Saxicava rugosa and pholadis — S. rugosa.

Hiatella spinosa — Saxicava arctica.

Solen ensis — S. ensis...S. siliqua — S. siliqua.

Listera vagina — Solen marginatus.

Phaxas pellucidus — Solen pellucidus.

Artusius legumen — Ceratisolen legumen.

Azor antiquatus — Solecurtus coarctatus.

Gobræus variabilis — Psammobia vespertina.

Adasius Loscombeus — Solecurtus candidus.

Mya arenaria — M. arenaria...M. truncata — M. truncata.

Magdala striata (pl. 12, f. 1, 2) — Lyonsia Norvegica.

Thracia convexa — T. convexa...T. declivis — T. pubescens and phaseolina.

Galaxura prætenuis — Cochlodesma prætenuis.

Ixartia distorta — Thracia distorta.

Lutraria elliptica — L. elliptica.

Psammophila Solenoides — Lutraria oblonga.

Oranthea Montaguana — Kellea suborbicularis.

Corbula nucleus (pl. 12, f. 10—13) — C. nucleus.

Pandora rostrata — P. rostrata...P. obtusa — P. obtusa (from description, not synonym).

Amphidesma Goodalliana — Montacuta ferruginosa...A. prismatica — Syndosmya prismatica...A. Boysiana — S. alba.

Eupoleme cancellata — Lepton squamosum.

Orixa tenuis — Syndosmya tenuis.

Trigonella Listeriana — Scrobicularia piperata.

Lembulus sulcatus (pl. 12, f. 3, 4) — Leda caudata.

Nucula margaritacea — N. radiata and nucleus.

Mactra stultorum — M. stultorum...M. subtruncata — M. subtruncata ...M. truncata — M. solida, var. truncata...M. solida — M. solida.

Dorvillea Anglica — ? ?

Autonoe rubra (pl. 12, f. 5, 6, 7) — Kellia rubra.

Cyclas rivicola — C. rivicola...C. lacustris — C. lacustris ?...C. cornea — C. cornea...C. stagnicola — C. cornea (teste Sheppard); calyculata (teste Lam.)...C. alata — ? ?.

Euglesa Henslowiana = Pisidium pusillum (teste Gray).

Pera Henslowiana — Pisidium ?...P. amnica — P. ?...P. fluviatilis — P. ?...P. appendiculata — P. Henslowianum...P. pulchella — P. pulchellum...P. gibba — P. obtusale (teste Gray).

Cordula amnica — Pisidium amnicum.

Psammobia incarnata — Psammobia Ferroensis.

Tellina tenuis — T. tenuis...T. fabula — T. fabula...T. Donacina — T. Donacina...T. depressa — T. incarnata.

Limicola carnaria — Tellina solidula.

Donax variegatus — D. politus...D. trunculus — D. anatinus.

Capsa Irus — Venerupis Irus...C. virginea — Tapes virginea...C. deflorata — T. aurea...C. perforans, pullastra — T. pullastra...C. reticulata — T. decussata.

Crassina Britannica — Astarte sulcata.

Chione coccinea — Cytherea Chione...C. minima — Circe minima.

Cyprina Islandica — C. Islandica.

Calista verrucosa — Venus verrucosa...C. casina — V. casina.

Hermione gallina — Venus striatula...H. laminosa (pl. 12, f. 8) — V. striatula, var....H. reflexa — V. casina, var.

Zucleica fasciata — Venus fasciata.

Pasiphaë Pennantiana — Venus ovata.

Isocardia cor — I. cor.

Loripes lacteus — Lucina leucoma.

Lucina radula — L. borealis...L. divaricata — L. divaricata (of Chemnitz ?).

Thyasira flexuosa — Lucina flexuosa.

Amphithæa exoleta — Artemis exoleta and lincta.

Glocomene Montaguana — Diplodonta rotundata.

Cyrachæa spinifera — Lucina spinifera.

Cydippe Listeriana — Tellina crassa.

Cardium aculeatum — C. aculeatum...C. echinatum — C. echinatum... C. tuberculatum — C. rusticum...C. edule — C. edule...C. tenue — C. edule ? var....C. zonatum — C. fasciatum (probably)...C. exiguum — C. pygmæum...C. læve — C. Norvegicum.

Damaris elongata — Unio margaritiferus.

Unio ovalis — U. tumidus...U. pictorum — U. pictorum.

Anodontes Europæa — Anodonta cygnea.

Pinna fragilis, elegans — Pinna pectinata.

Modiola Papuana — M. modiolus...M. Gibbsiana — M. barbata...M. Prideauxiana (pl. 12, f. 9) — Crenella rhombea...M. discrepans — C. discors and nigra...M. discors — C. marmorata.

Mytilus edulis, pellucidus — M. edulis.

Arca Noæ — A. tetragona...A. Pennantiana — A. lactea.

Pectunculus glycimeris, P. pilosus — P. glycimeris.

Avicula Britannica = A. Tarentina.

Pecten maximus — P. maximus...P. opercularis — P. opercularis...P. varius — P. varius...P. sinuosus — P. pusio...P. obsoletus — P. tigrinus.

Lima Loscombea — L. Loscombei...L. reticulata — L. hians...L. tenuis — L. ?...L. unicostata — L. subauriculata.

Ostrea edulis — O. edulis.

Anomia ephippium — A. ephippium...A. squammula — A. ephippium, var....A. aculeata — A. aculeata...A. squamosa — A. aculeata, var. (probably)...A. undulata— A. patelliformis...A. lens — A. ephippium. var ?...A. cymbiformis, A. pellucida, A. cepa, A. electrica — A. ephippium, vars.

Criopus Orcadensis (pl. 13, f. 7, 8) — Crania Norvegica.

Terebratula glabra (pl .13, f. 3, 4, 5) — T. cranium (from figure, not desc.) ...T. striata (pl. 13, f. 1, 2) — T. caput-serpentis.

Euclusæa Pandorida — ? ?...E. fragilis — ? ?.

EMENDATIONS AND ADDITIONS TO THE PLATES OF SHELLS.

The Engravings having been published in many cases long before the text had been written, the names attached to the delineations do not always correspond to those mentioned in the letter-press. The following corrections are consequently requisite.

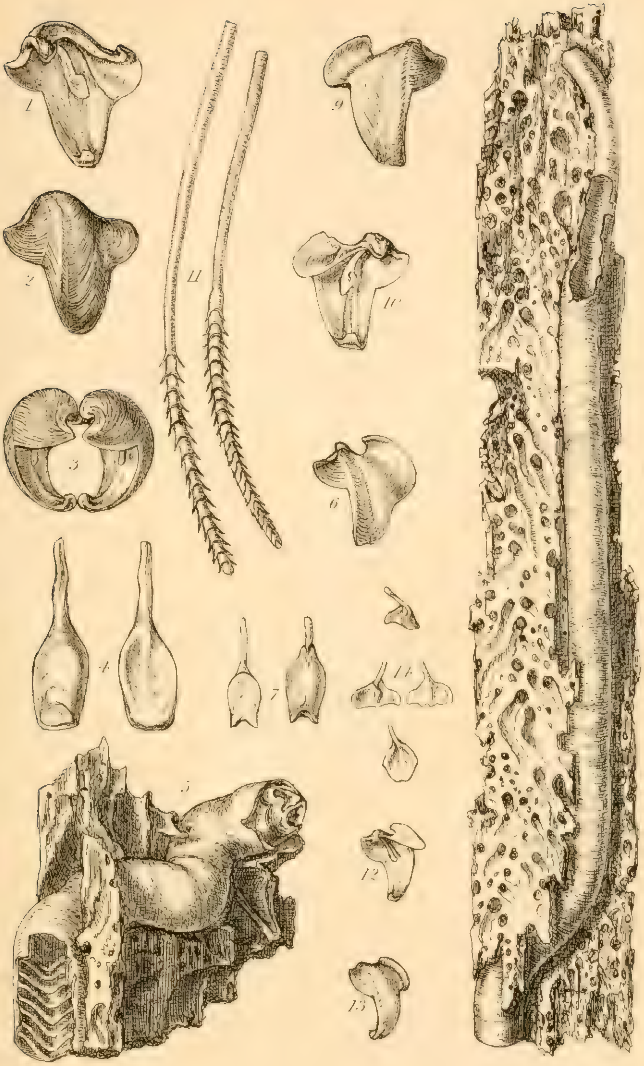
Plate I. f. 4, 7, enlarged.
VI. f. 4, 5, enlarged; 9 to 14 slightly so.
XIII. f. 2, Ceratisolen, not Solen.
XVII. f. 11, enlarged.
XVIII. f. 5, ferruginosa, not ferruginea.
XXIII. f. 1, solida, var. truncata, not truncata.
XXX. f. 5, 6, sulcata, not triangularis and Danmoniensis.
XXXIV. f. 1, greatly enlarged.
XXXV. f. 2, leucoma, not lactea.
XXXVI. f. 3, 4, Lepton nitidum not Kellia nitida ; 5, 6, 7, Kellia not Poronia ; 10 enlarged.
XXXVIII. Unio margaritiferus not Alasmodonta margaritifera.
XLIV. f. 5, Crenella, not Modiola.
LVII. f. 9, Argiope, not Megathyris, much enlarged ; 11, a. b. 12, a. b. magnified.
LVIII. f. 1, 3, enlarged.
LIX. f. 3, enlarged.
LX. f. 1, 2 Pileopsis, not Capulus.
LXII. f. 6, Pilidium, not P.
LXIII. f. 1, reticulata, not Mülleri.
LXV. f. 4, 5, lineatus, not crassus.
LXVI. f. 7, 8, alabastrum, not formosus.
LXXII. f. 3, 4, pallidula, var. patula, not patula.
LXXIX. all the figures enlarged.
LXXXI. f. 6, 7, Assiminea, not Rissoa ?
LXXXIII. f. 4,
LXXXIV. f. 11, 12, } Littorina rudis, varieties.
LXXXV.
LXXXVI. f. 4, 5,
XC. f. 1, Chemnitzia, not Rissoa.
XCI. f. 7, 8, Cerithiopsis, not Cerithopsis.
XCIII. f. 4. fulvocincta, not rufa.
XCIV. f. 8, dubia, not unidentata, var.
XCVIII. all the figures enlarged.
CII. f. 5, 6, corallinus, not coralinus.
CXIV. f. 5, 6, much enlarged; the rest, except f. 4, slightly enlarged.
CXIV.D. f. 1, 2, Amphisphyra, not Amphispyra.
CXX. Zonites, not Helix.
CXXI. f. 1 to 6, Zonites, not Helix.
CXXII. f. 1, Zonites not Helix ; 6, 7, hypnorum, not hyphorum.
CXXV. f. 7, lineata not fusca.
CXXVI. f. 6, 7, Nautileus, not imbricatus; 8, 9, glaber, not lævis.
CXXVII. f. 2 and 4, are reversed.
CXXVIII. f. 1 to 4, a little enlarged ; 6, Lackhamensis, not Lackamensis ; 8, 9, fragilis, not perversa.
CXXIX. f. 3 to 6, enlarged, 5 secale, not juniperi ; 7, 8, 9, magnified.
CXXX. all the figures magnified.

DIRECTIONS TO THE BINDER.

It is suggested, in order to as much as possible equalize the thickness of the volumes, that the Plates of Animals (marked with letters) be placed at the end of Vol. I., and the Plates of Shells (marked with figures) be placed at the end of Vol. IV.

LONDON:
Printed by Samuel Bentley and Co.
Bangor House, Shoe Lane.

PLATE 1.



1 to 4. Teredo Norvagica, valves and pallets.

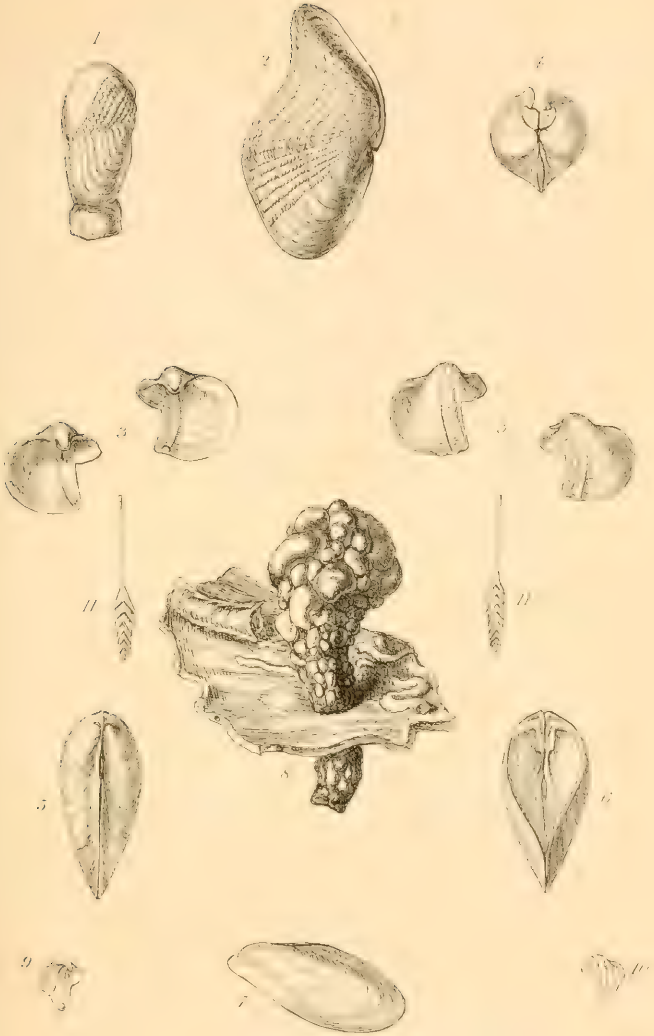
5. Ditto, tube exhibiting concamerated structure and hinder aperture.

6. T. megotara. 7. T. navalis pallets.

8. Ditto, tube broken to show its simple structure.

9, 10, 11. T. bipennata. 12. 13. 14. T. malleolus.

London



1. Phol^{a} papyracea. dwarf variety. 2. Pholas parva, var.

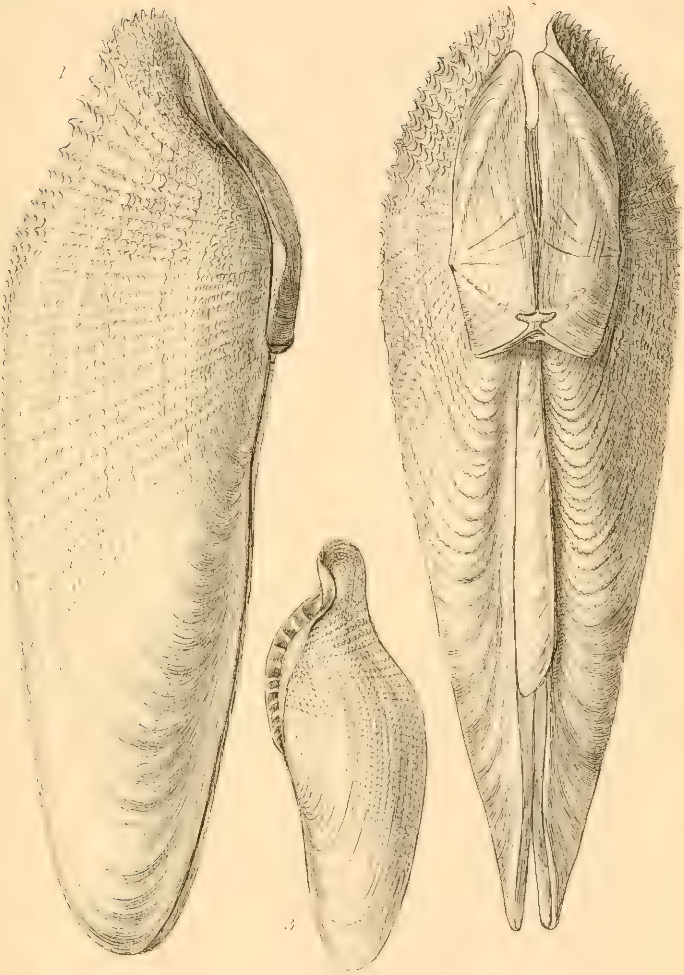
3, 4. Xylophaga dorsalis. 5, 6, 7. Gastrochœna modiolina, valves.

8. Ditto. tube or case. 9, 10. Teredo palmulata.

11. Ditto. pallets magnified.

London. Published by John Van Voorst. 1848.

PLATE III.

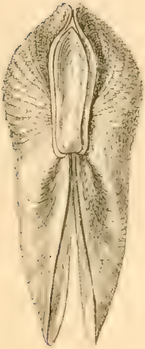


Pholas dactylus.

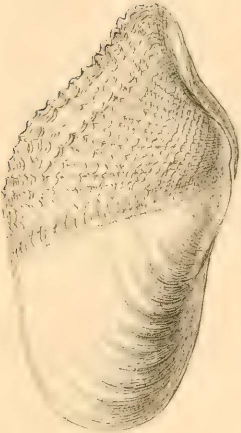
London, Published by John Van Voorst, 1848

PLATE IV.

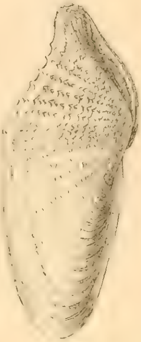
1



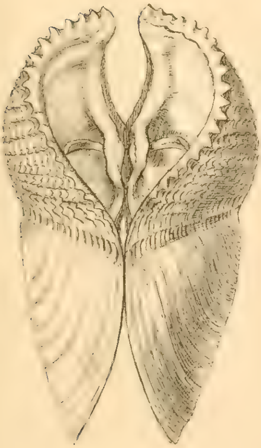
3



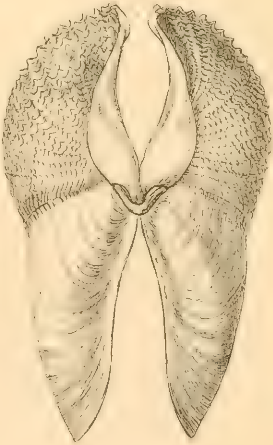
2



4



5



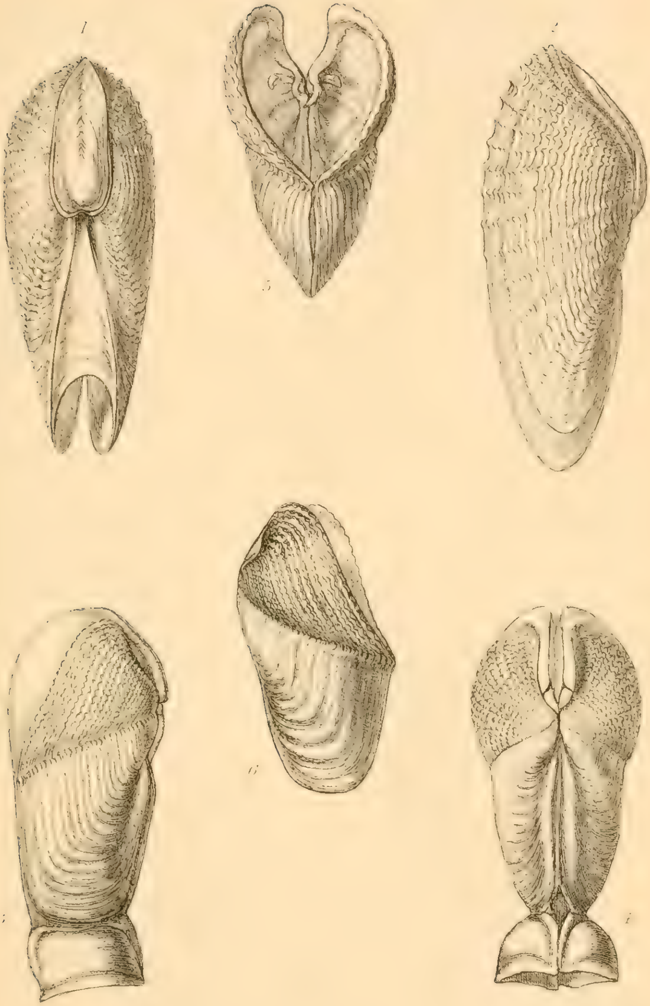
G.B.Sowerby. Jun.r exc.

1.2. Pholas parva.

3.4.5. —— crispata.

London. Published by John Van Voorst. 1848.

PLATE V.



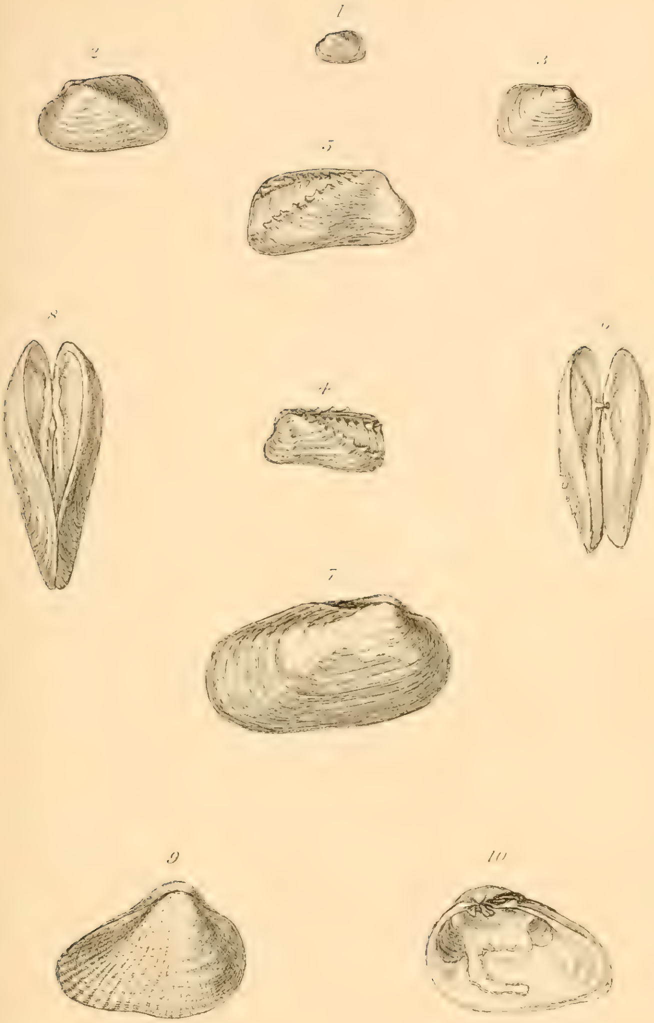
1, 2. Pholas candida.

3, 4. Pholadidea papyracea.

5, 6. Ditto, young. (P. lamellata. Turton.)

London, Published by John Van Vo

PLATE VI.



G.B. Sowerby. Jun.r exc

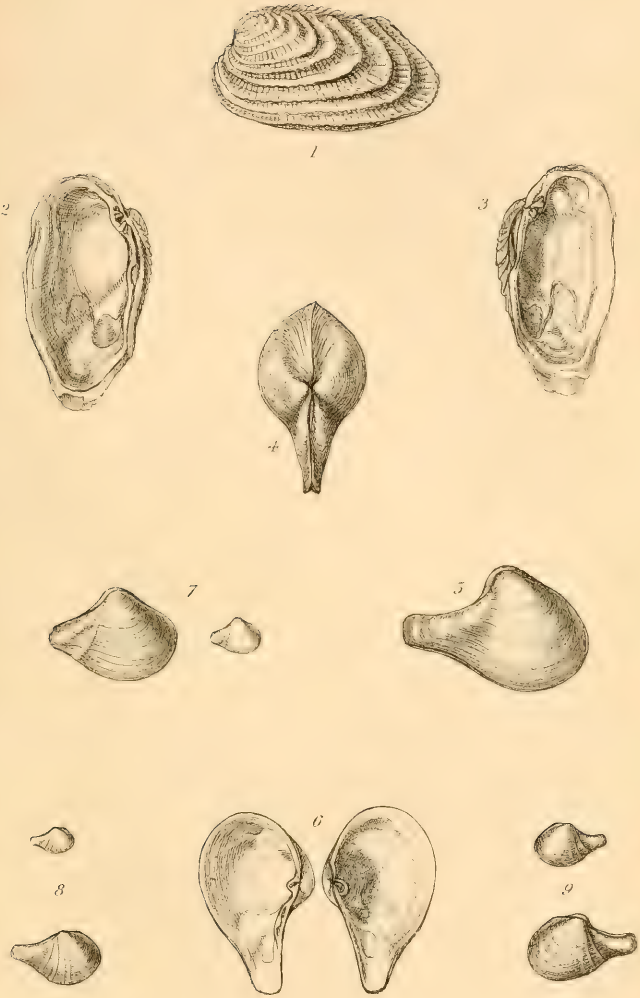
1. Fry of 7? 2.3. Ditto magnified.

4. Saxicava arctica. 5.6. Ditto magnified.

7.8. S. rugosa. 9.10. Petricola lithophaga.

London. Published by John Van Voorst. 1848.

PLATE VII.



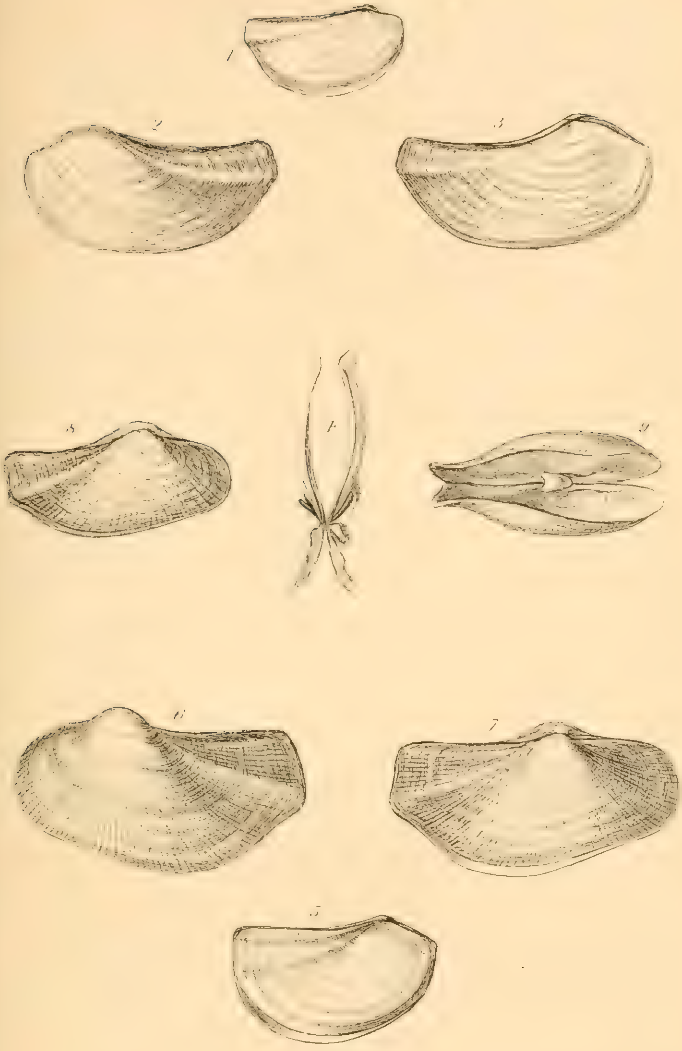
[illegible] erby. Jun.r sc

1.2.3. Venerupis Irus. 4.5.6. Neæra cuspidata.

7. N. abbreviata.(magnified) 8.9. N. costellata.(do.)

London, Published by John Van Voorst. 1848

PLATE VIII.



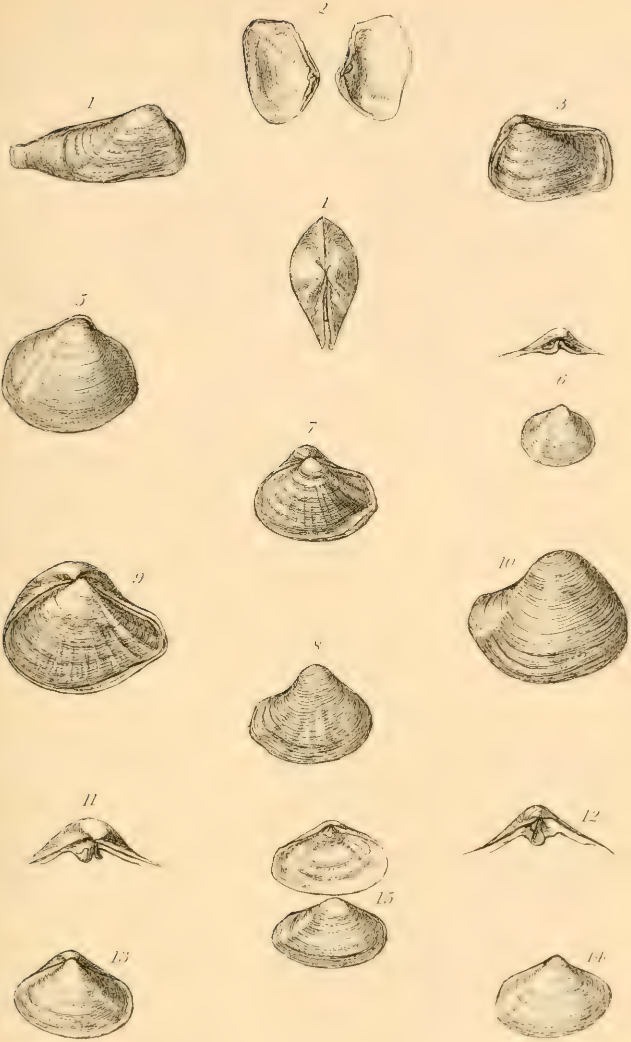
G.B. Sowerby Jun.r sc.

1, 2, 3, 4. Pandora rostrata. 5, P. obtusa.

6, 7, 8, 9. Lyonsia Norvegica.

London, Published by John Van Voorst. 1848.

PLATE IX.



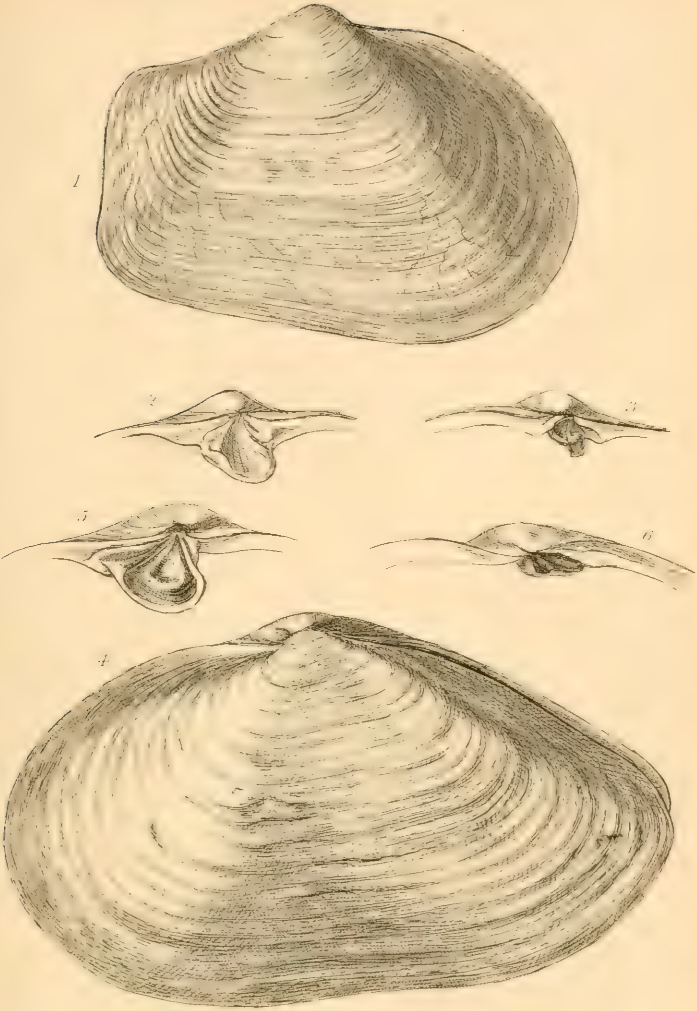
2
1
3
4
5
6
7
9
10
8
11
12
15
13
14

1, 2, 3. Sphænia Binghami. 4, 5, 6. Poromya granulata.

7 to 12. Corbula nucleus. 13, 14. C. rosea. 15. C. ovata.

London, Published by John Van Voorst

PLATE X.

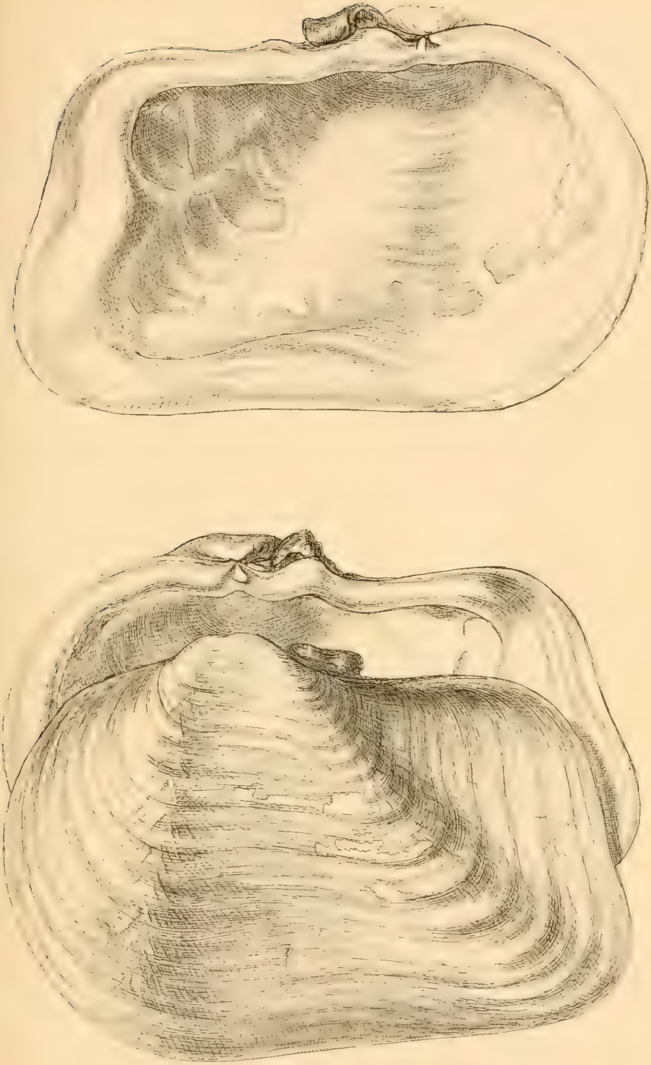


1.2.3. Mya truncata.

4 5.6. — arenaria.

London. Published by John Van Voorst.

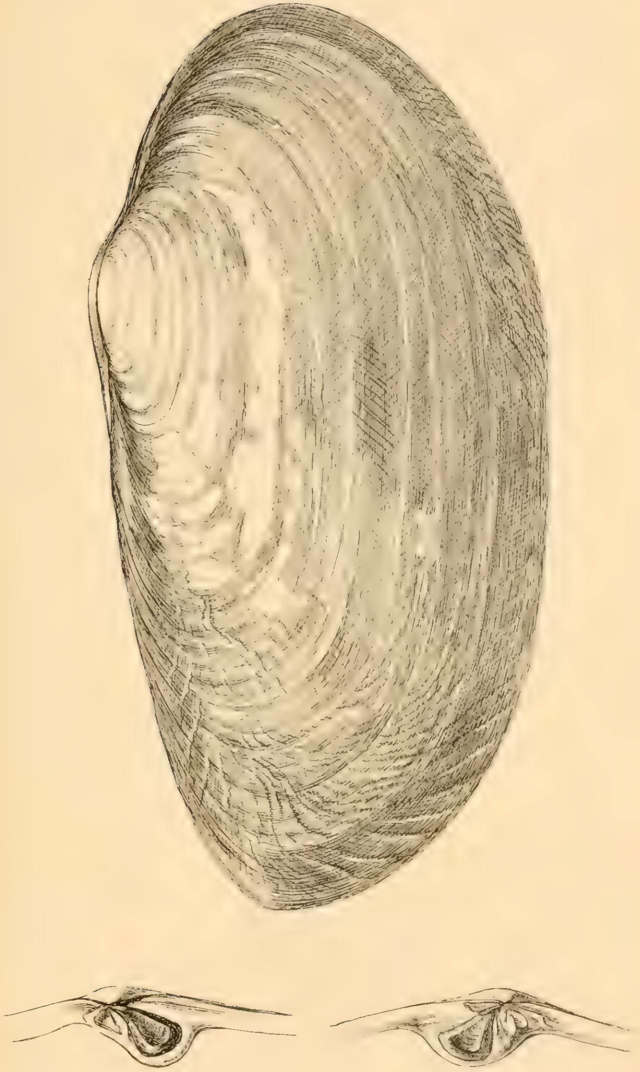
PLATE XI.



Panopæa Norvegica.

London, Published by John Van V

PLATE XII.



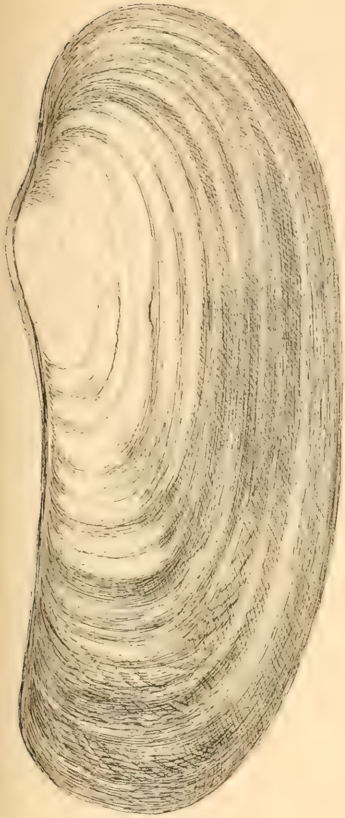
Sowerby, Junr. exc.

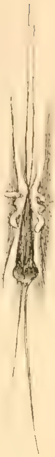
Lutraria elliptica.

London Published by John Van Voorst, 1848.

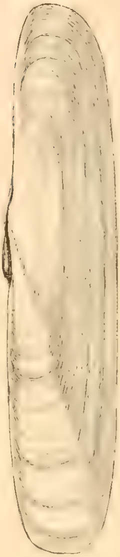
PLATE XIII.

1

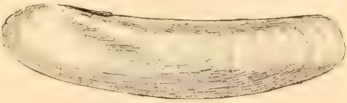




2



3



G B Sowerby, Jun.r exc

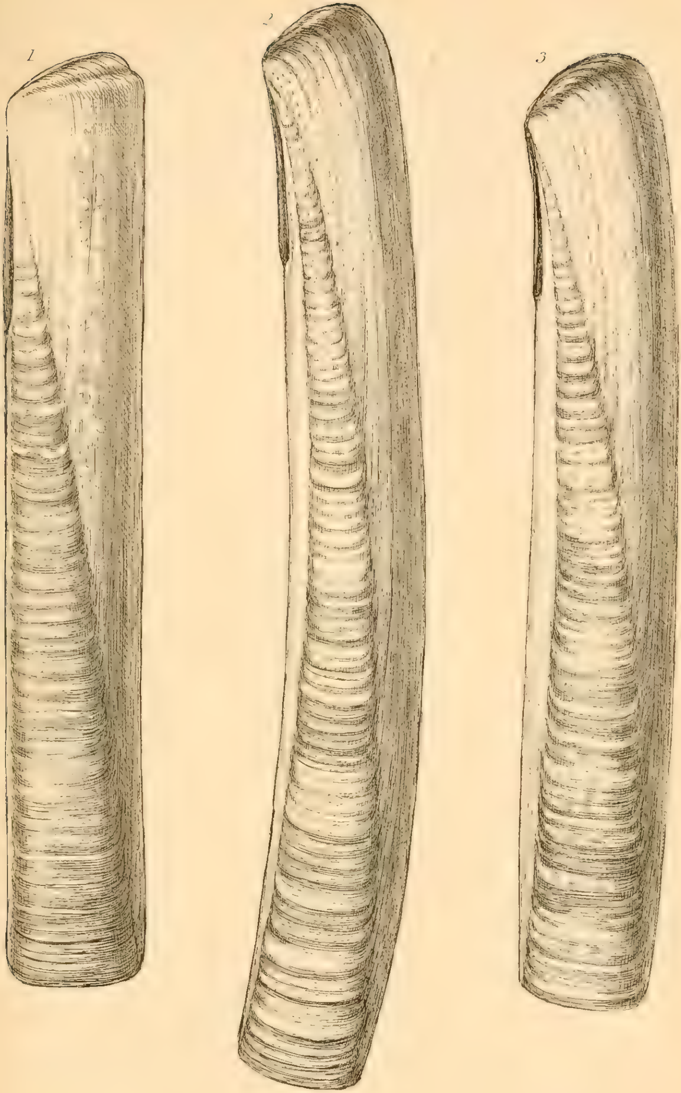
1. Lutraria oblonga.

2. Solen legumen.

3. S. pellucidus.

London, Published by John Van Voorst, 1848.

PLATE XIV.



G.B. Sowerby, Jun.r exc.

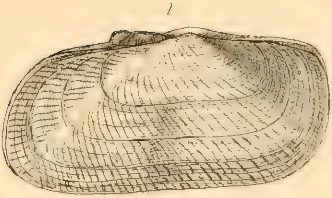
1. Solen marginatus.

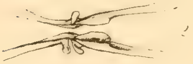
2. S. ensis var. magna.

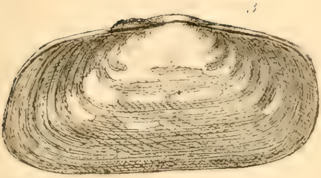
3. S. siliqua.

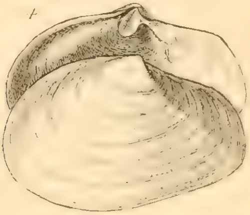
London, Published by John Van Voorst, 1848.

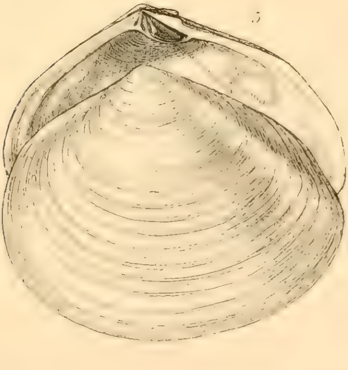
PLATE XV.









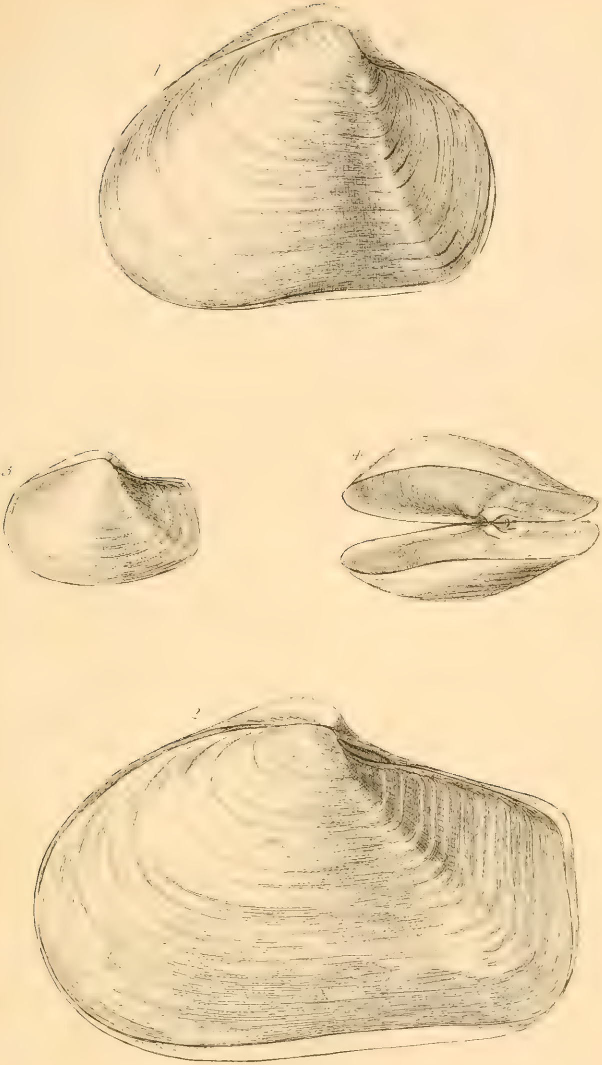


1.2. Solecurtus candidus. 3. S. coarctatus.

4. Cochlodesma prætenuis. 5. Scrobicularia piperata.

London. Published by John Van Voorst. 1848.

PLATE XVI.



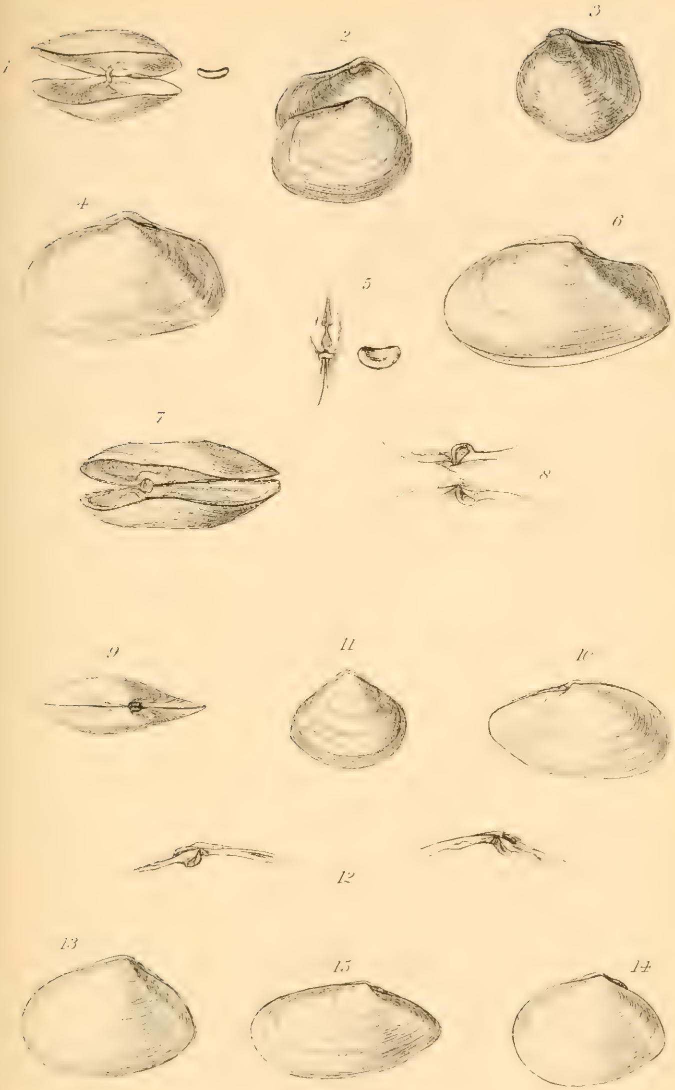
G.B. Sowerby, Jun.r sc.

1.4. Thracia convexa.

2,3. T. pubescens.

London, Published by John Van Voorst, 1848.

PLATE XVII.


1
2
3
4
5
6
7
8
9
11
10
12
13
15
14

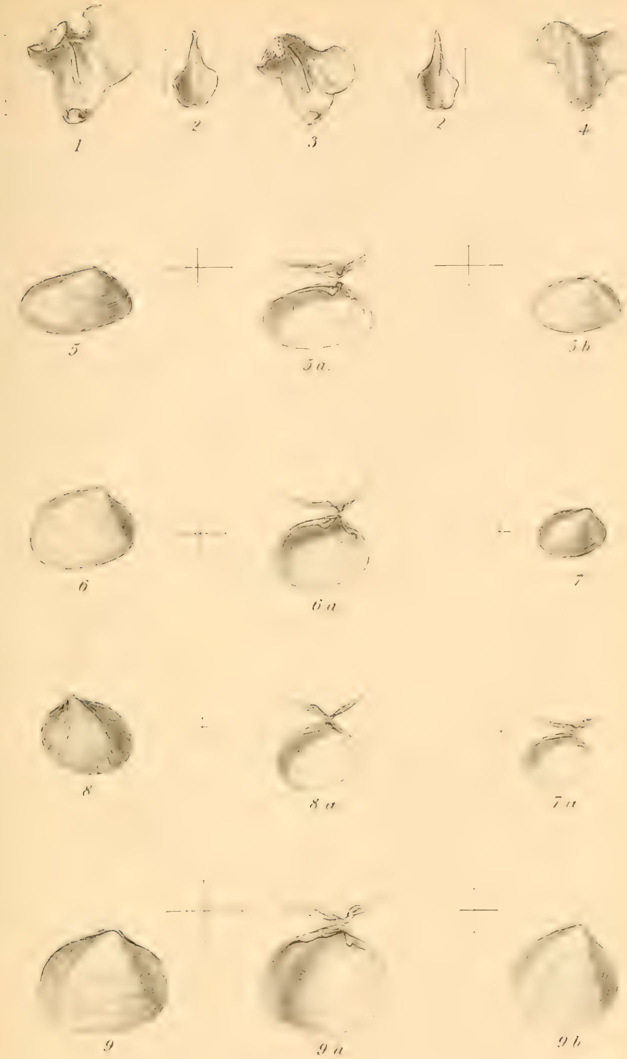
G.B. Sowerby Junr. exc.

1.2.3.8. Thracia distorta. 4.7. Th. villosiuscula. 5.6. Th. phaseolina.

9.10. Syndosmya intermedia. 11. S. tenuis. 12.13.14. S. alba.

London. Published by John Van Voorst. 1848.

PLATE XVIII.



G. B. Sowerby, Jun.ʳ exc.

1, Teredo megotara; 2, 2, pallets of the same.

3, 4, —— navalis.

5, Montacuta ferruginea; 5, a, inside; 5, b, variety.

6, ———— bidentata; 6, a, inside.

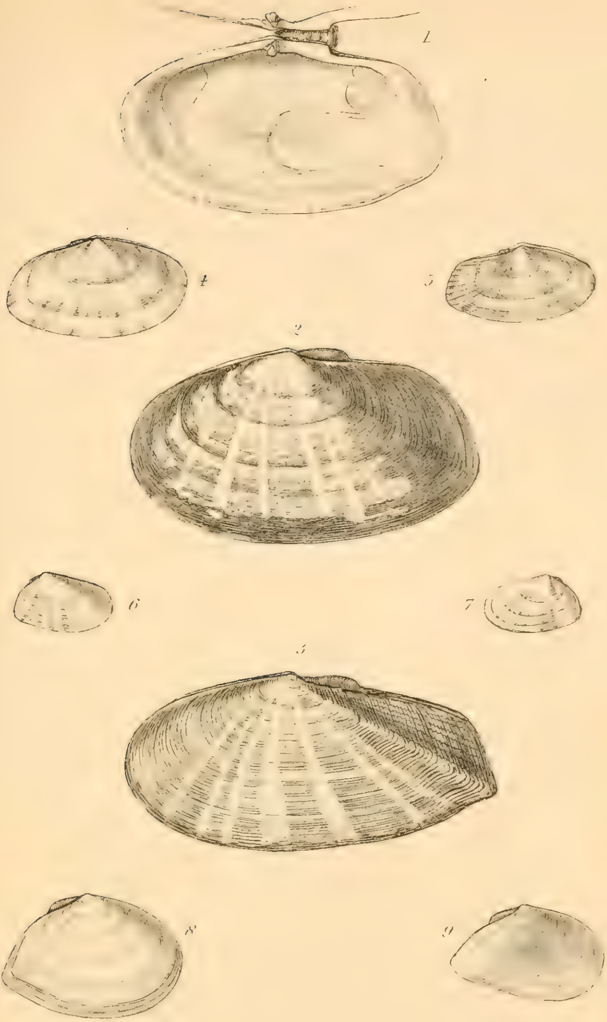
8, ———— substriata; 8, a, inside.

7, Turtonia minuta; 7, a, inside.

9, Kellia suborbicularis; 9, a, inside; 9, b, variety.

London. Published by John Van Voorst, 1848.

PLATE XIX.



G.B. Sowerby, Jun.r del.

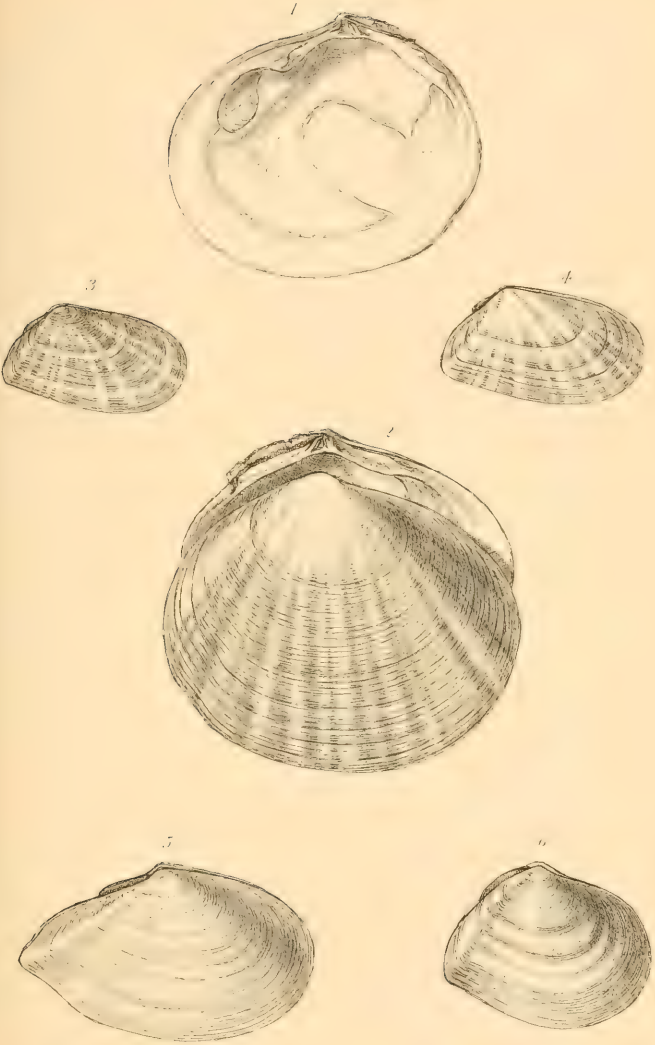
1, 2. Psammobia vespertina. 3. P. Ferroensis.

4. P. Tellinella. 5. P. costulata.

6. 7. Tellina pygmæa. 8. T. tenuis. 9. T. fabula.

London. Published by John Van Voorst. 1848.

PLATE XX

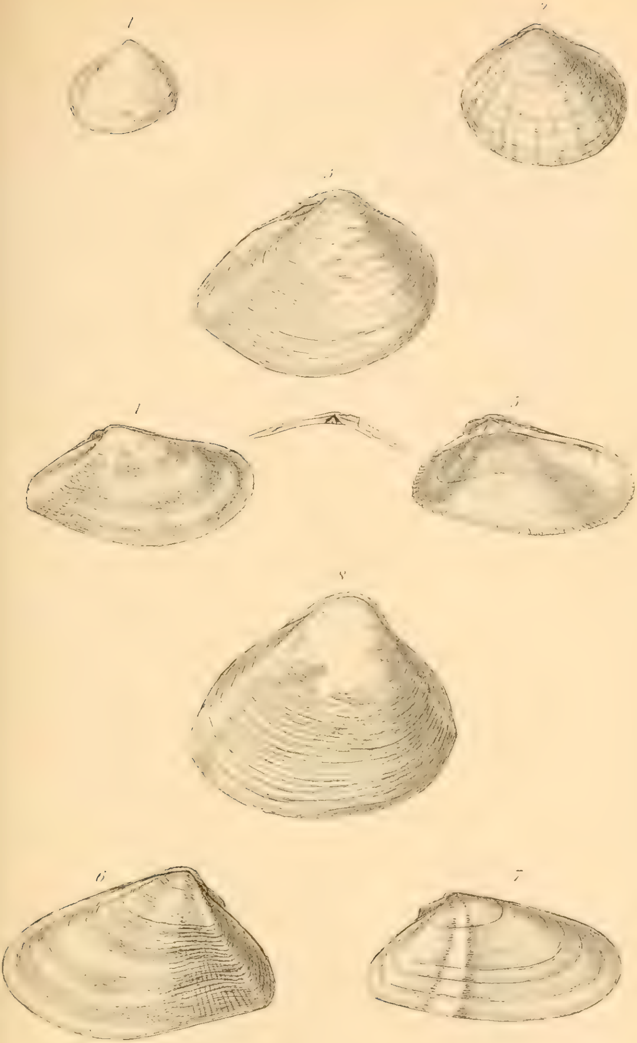


1,2. Tellina crassa. 3,4. T. Donacina.

5. T. incarnata. 6. T. solidula.

London. Published by John Van Voorst. 1848.

PLATE XXI.


1
2
3
4
5
8
6
7
Sowerby, Jun.r ex.

1. Tellina proxima 2. T. balaustina.

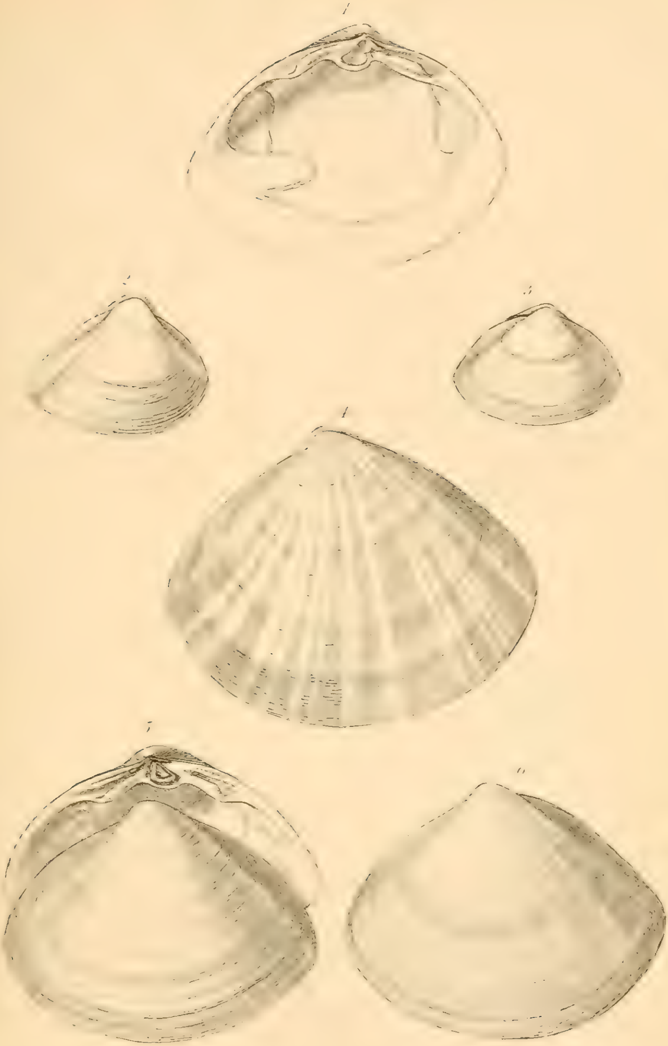
3. Diodonta fragilis.

4, 5, 6. Donax anatinus. 7. D. politus.

8. Mactra subtruncata, var.

London. Published by John Van Voorst. 1848.

PLATE XXII.

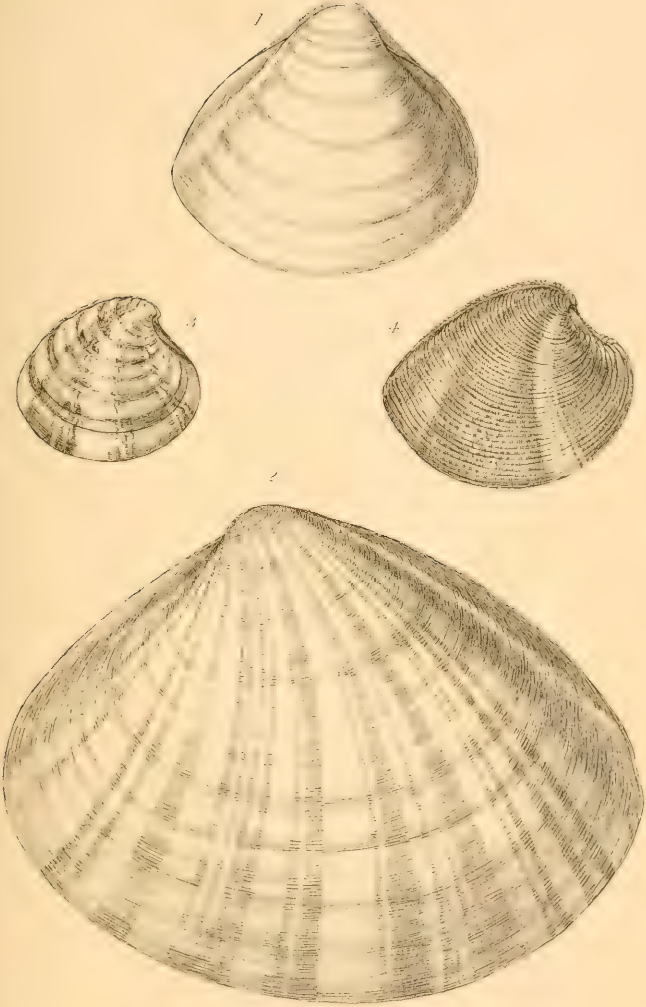


1, 5. Mactra solida. 2. M. subtruncata.

3. M. elliptica. 4, 6. M. stultorum.

London, Published by John Van Voorst. 1848.

PLATE XXIII.

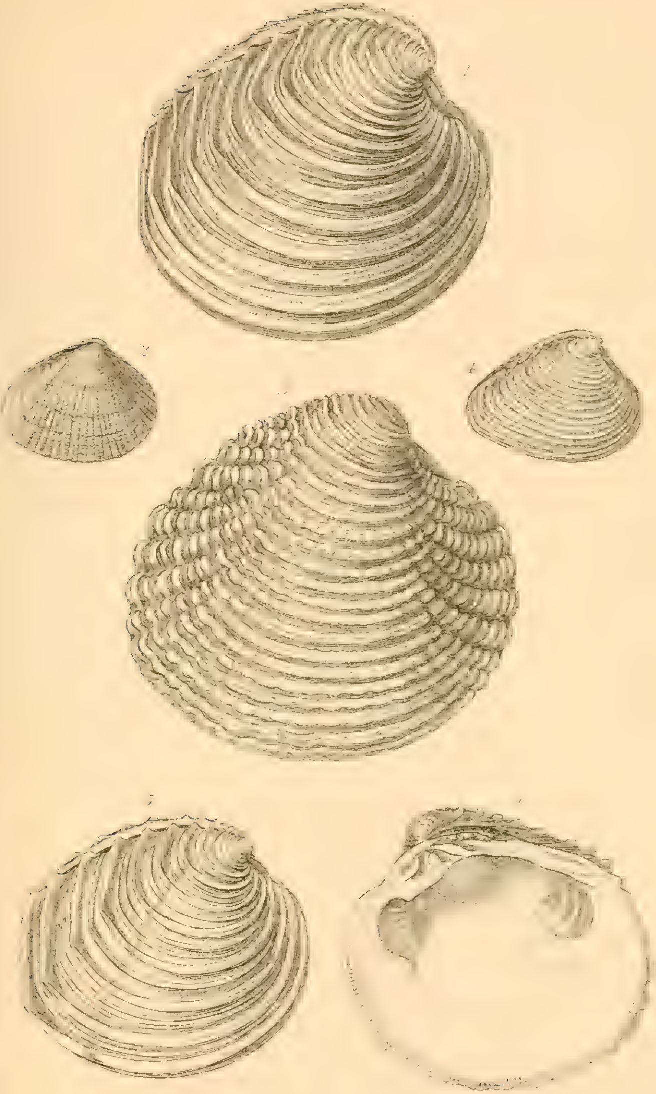


1. Mactra truncata. 2. M. helvacea.

3. Venus fasciata. 4. V. striatula.

London, Published by John Van Voorst, 1846

PLATE XXIV.

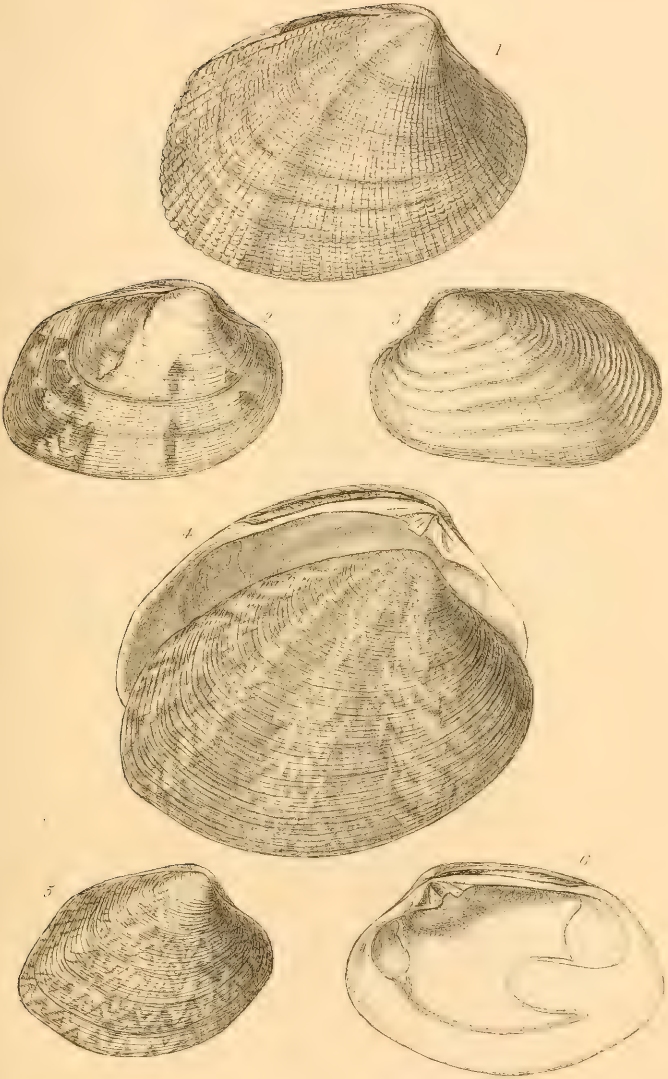


1.5.6. Venus casina. 2. V. ovata.

3. V. verrucosa. 4. V. striatula. var.

London, Published by John Van Voors

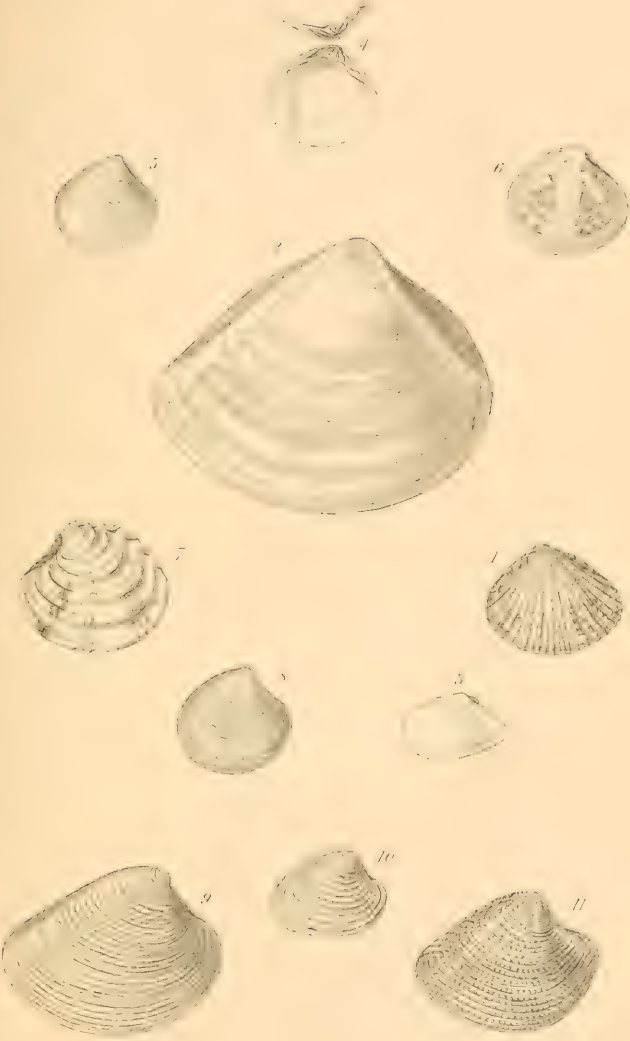
PLATE XXV



1. Tapes decussata. 2.3. T. pullastra.

4.6. T. virginea. 5. T. aurea.

PLATE XXVI



G.B. Sowerby. Junr. exc.

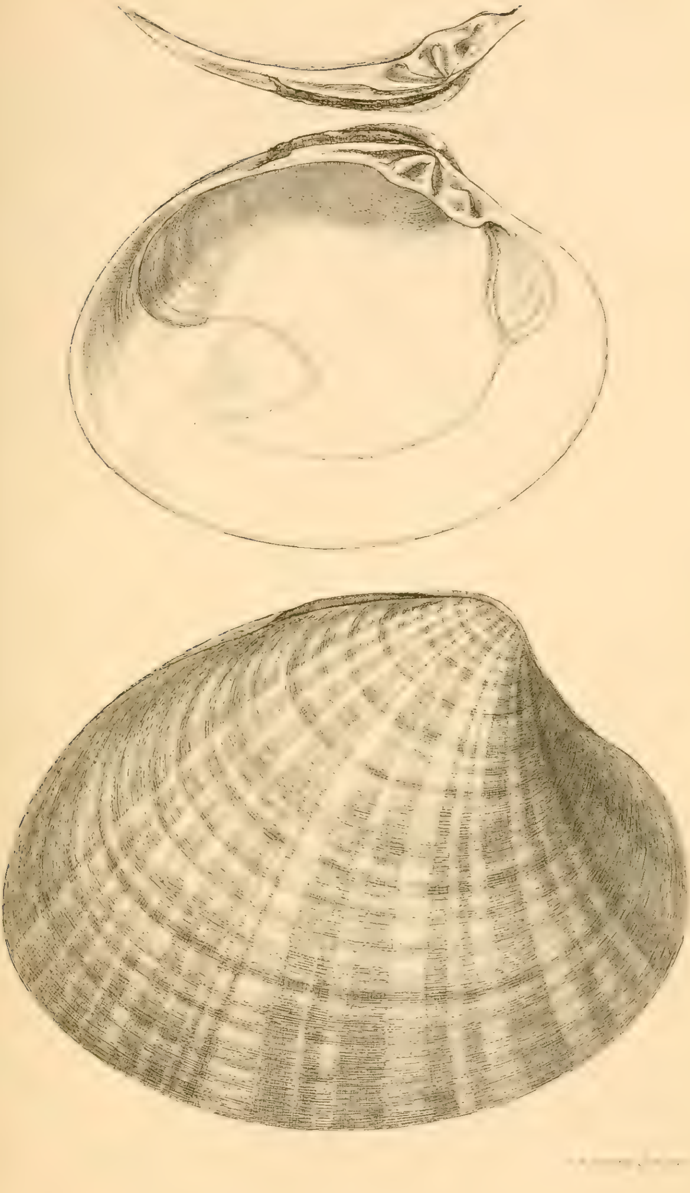
1. Venus ovata. 2. Mactra stultorum, var. cinerea.

3. Tellina fabula, var. 4.5.6.8. Circe minima.

7. V. fasciata, var. 9.10.11. V. striatula, varieties.

London. Published by John Van Voorst, 1848.

PLATE XXVII.

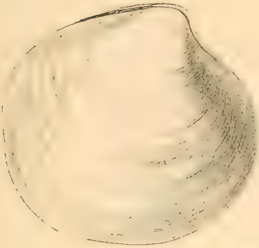


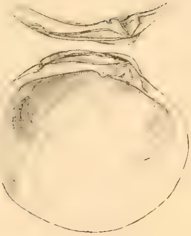
[illegible]

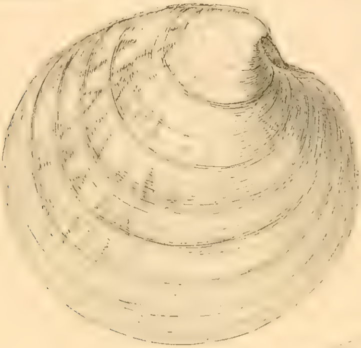
Cytherea Chione.

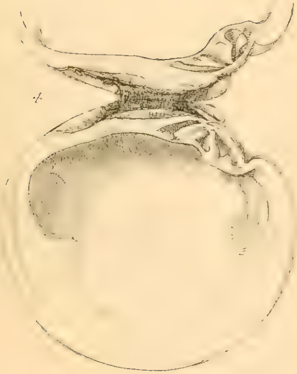
London Published by John V [illegible]

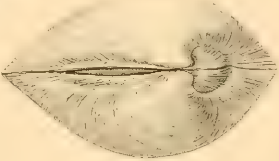
PLATE XXVIII.

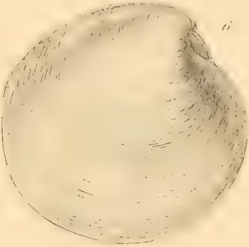

1


2


3


4


5


6

G.B. Sowerby, Jun^r exc.

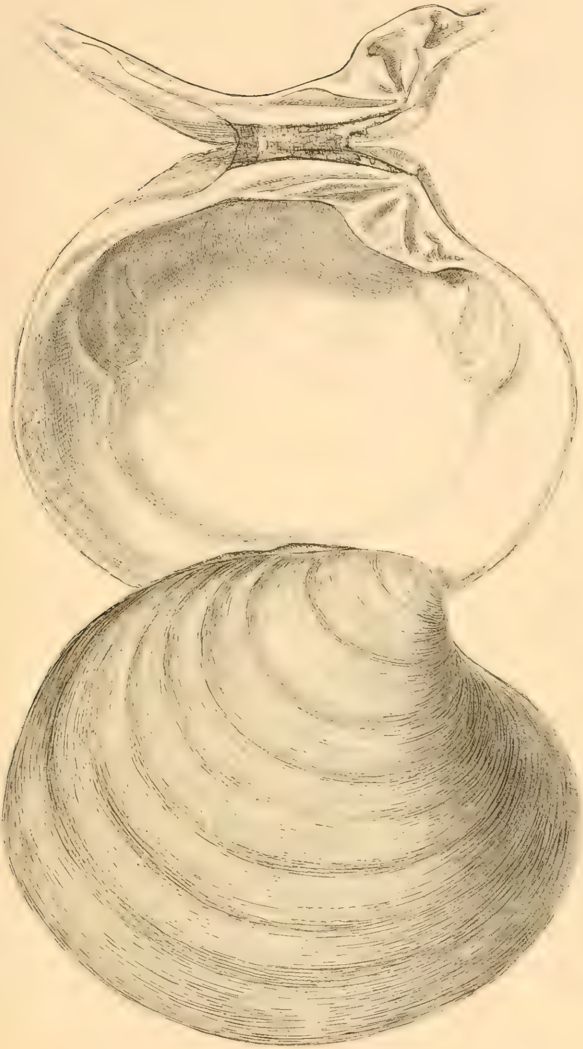
1.2. Lucinopsis undata.

3.4. Artemis exoleta.

5.6. A. lincta.

London Published by John Van Voorst. 1848.

PLATE XXIX.

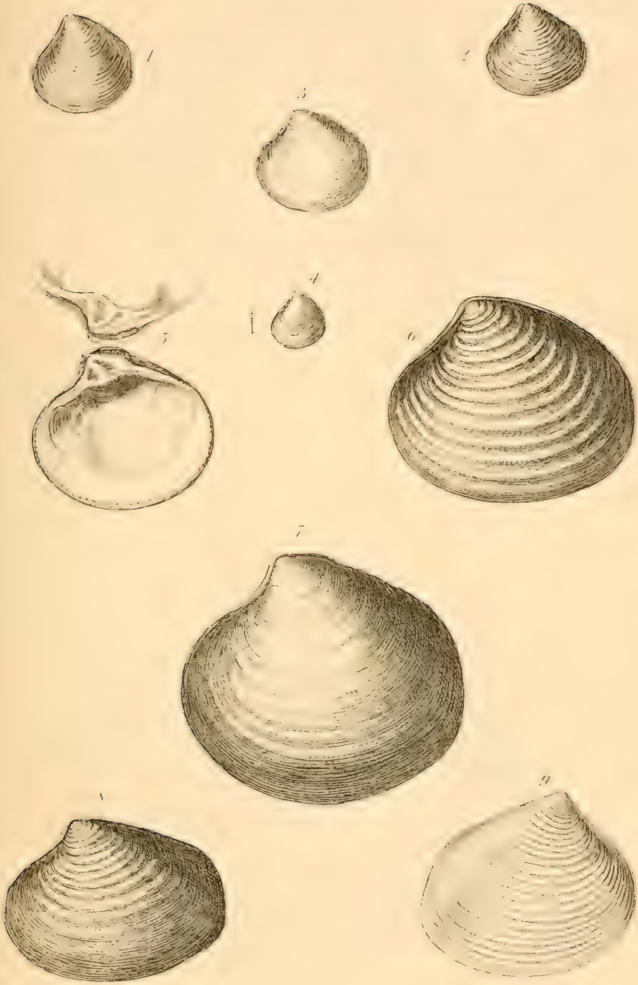


G.B. Sowerby, Jun.r exc.

Cyprina Islandica.

London. Published by John Van Voorst. 1848.

PLATE XXX.

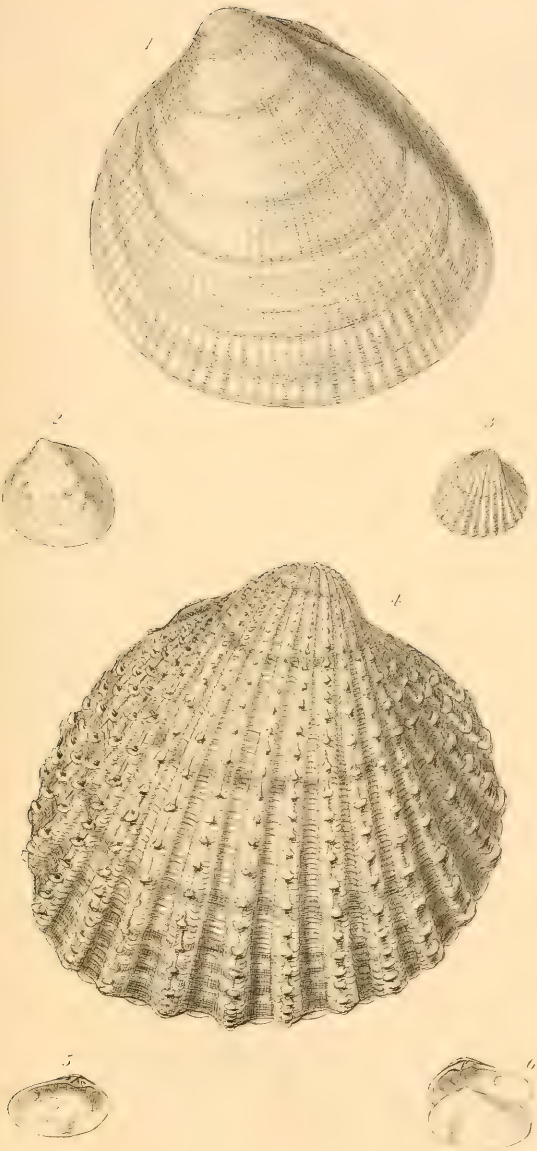


1, 2, 3. Astarte compressa. 4, 5. A. triangularis.

6. A. Dannoniensis. 7. A. Arctica.

8. A. elliptica. 9. A. crebricostata.

PLATE XXXI.

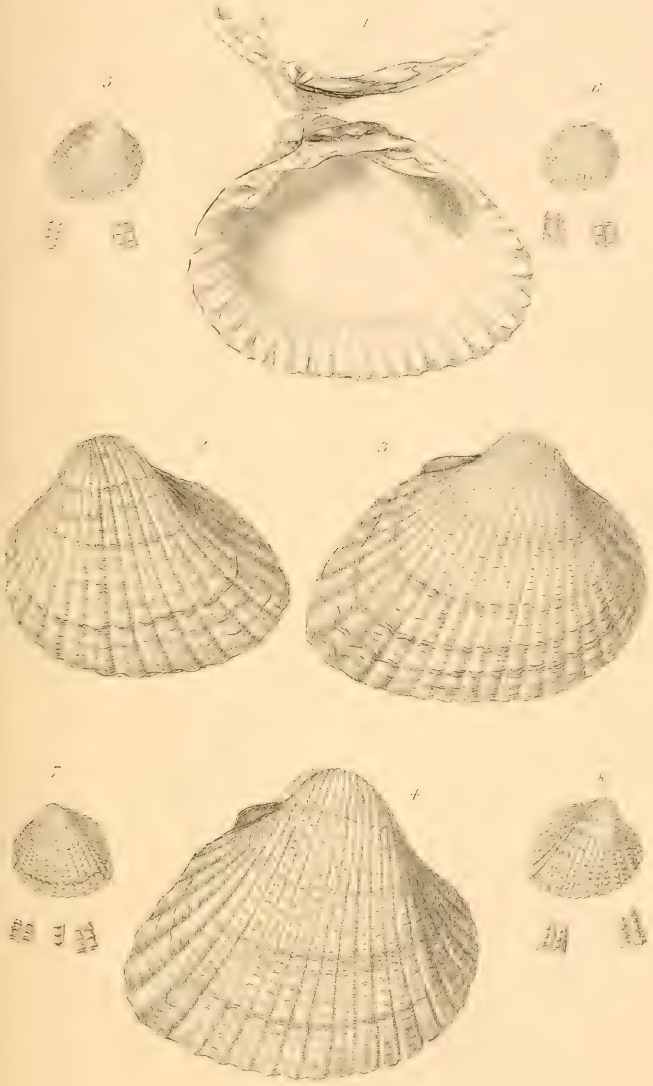


1,2. Cardium Norvegicum. 3,4. C. rusticum.

5,6. Ervilia castanea.

London Published by John Van Voorst 1848.

PLATE XXXII.



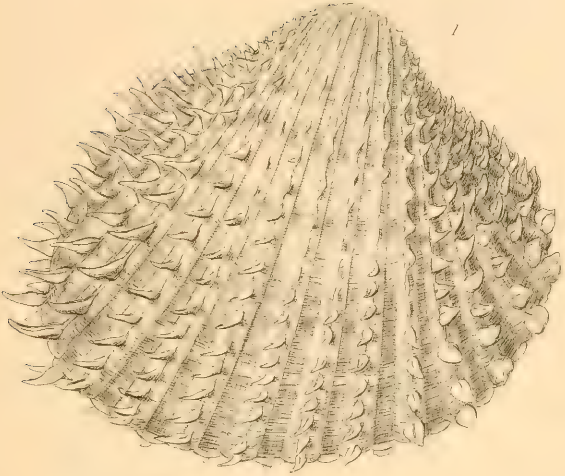
G.B. Sowerby. Jun.r sc.

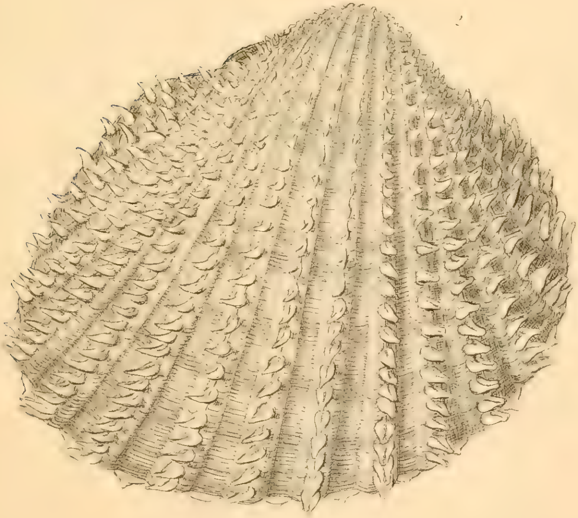
1 to 4. Cardium edule.   5. C. fasciatum.

6. C. Suecicum   7. C. nodosum.   8. C. pygmæum.

London. Published by John Van Voorst. 1848.

PLATE XXXIII.

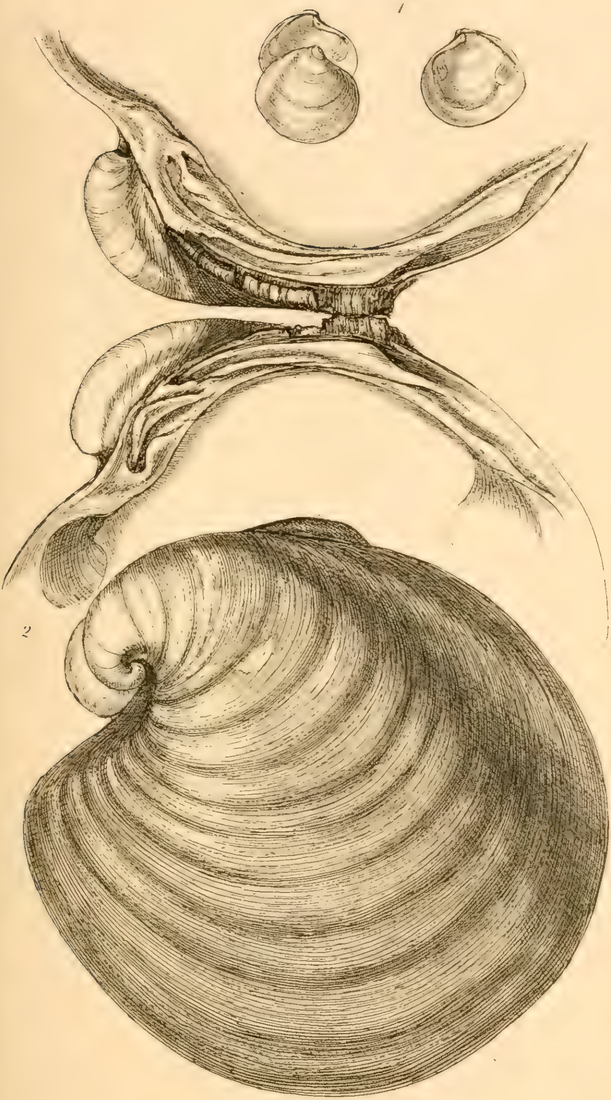

1


2

1. Cardium aculeatum. 2. C. echinatum.

London. Published by John Van Voorst, 1848.

PLATE XXXIV.

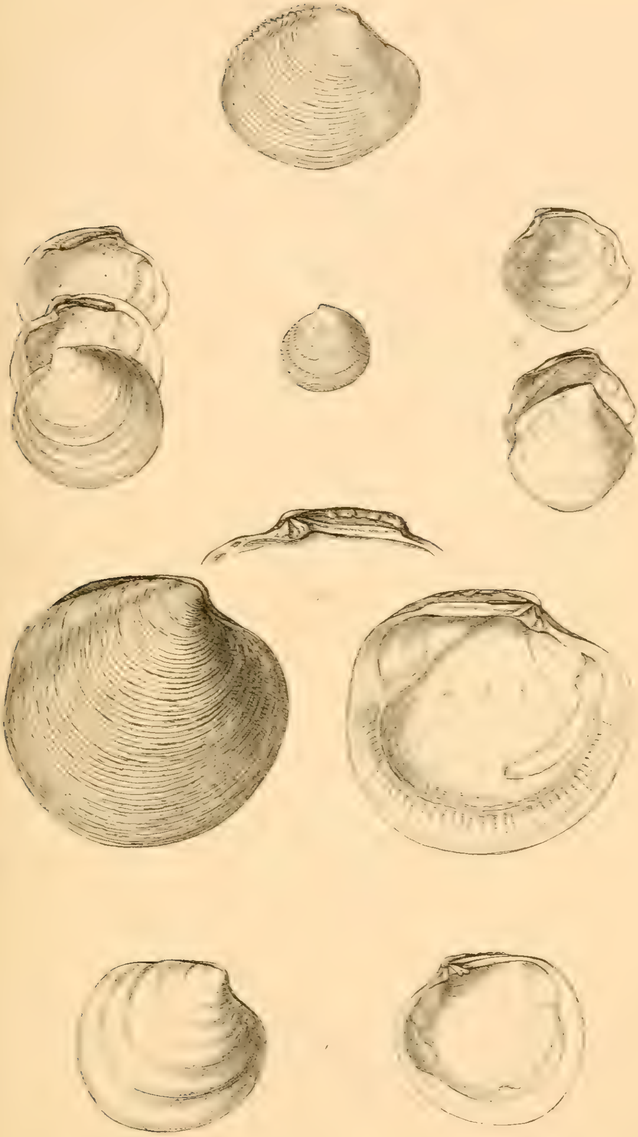


1. Lucina ferruginosa.

2. Isocardia cor.

London. Published by [illegible]

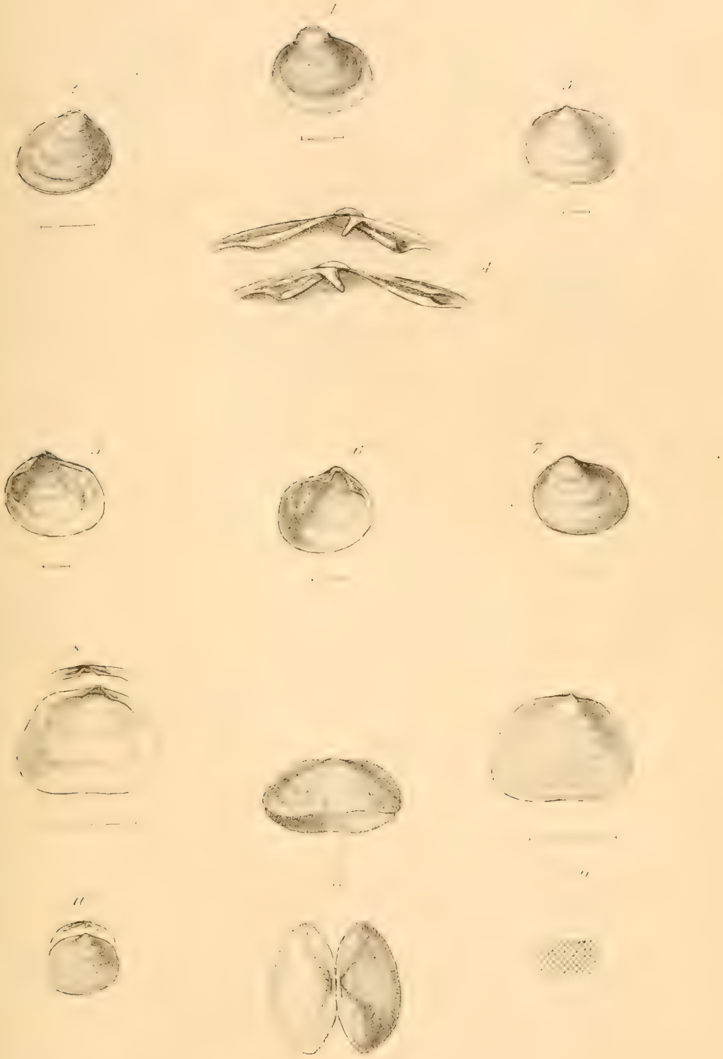
PLATE XXXV



1. Lucina spinifera. 2. L. lactea. 3. L. divaricata.

4. L. flexuosa. 5. L. borealis. 6. Diplodonta rotundata.

PLATE XXXVI

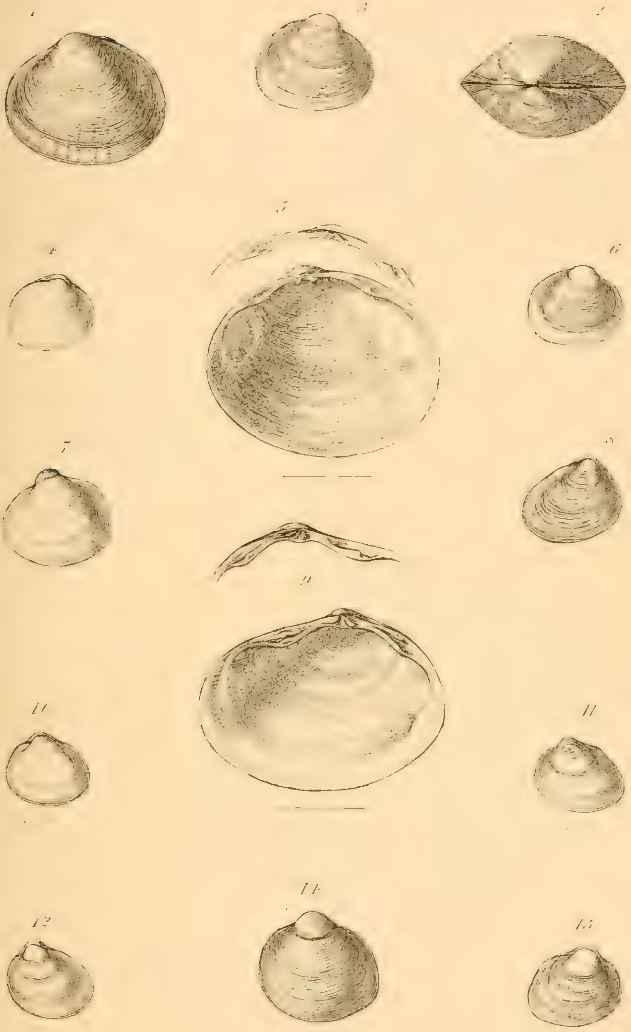


1. Pisidium obtusale. 2. P. Cinereum.

3.4. Kellia nitida. 5.6.7. Poronia rubra. 8.9. Lepton squamosum.

10. L. convexum. 11. Galeomma Turtoni.

PLATE XXXVII.

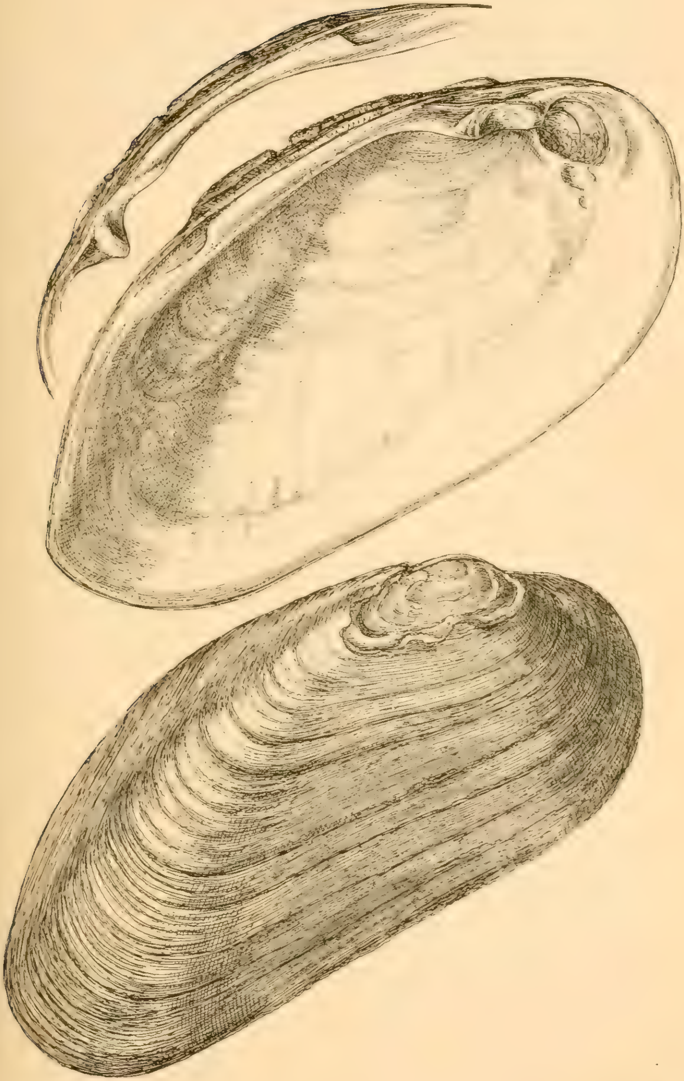

1
3
2
5
4
6
7
8
9
10
11
14
12
13

1,2. Cyclas rivicola. 3,4,5,6. C. cornea. 7. C. lacustris.

8,9. Pisidium amnicum. 10. P. pusillum. 11. P. Henslowianum.

12,13. P. pulchellum. 14. P. nitidum.

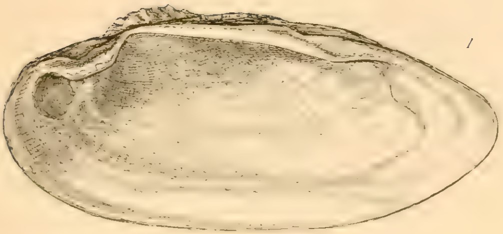
PLATE XXXVIII.

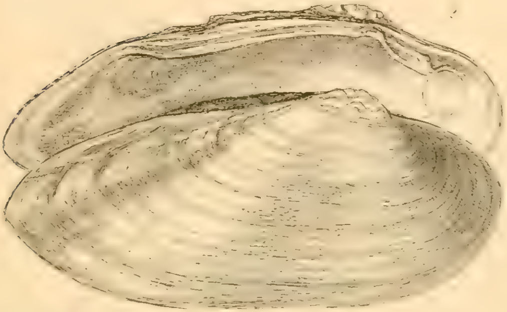


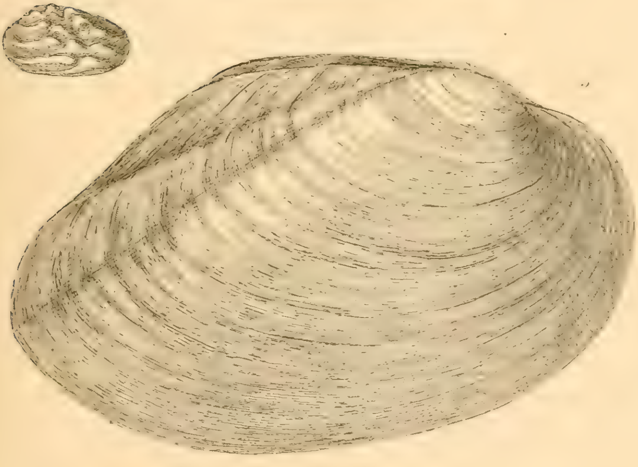
Alasmodonta margaritifera.

[illegible] *hed by* [illegible]

PLATE XXXIX.


1

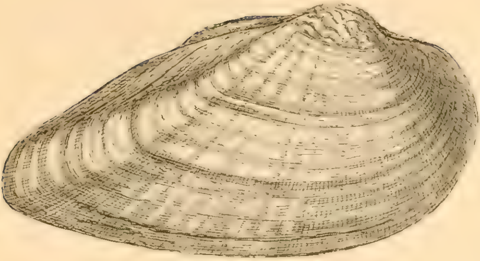

2

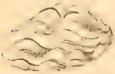

3

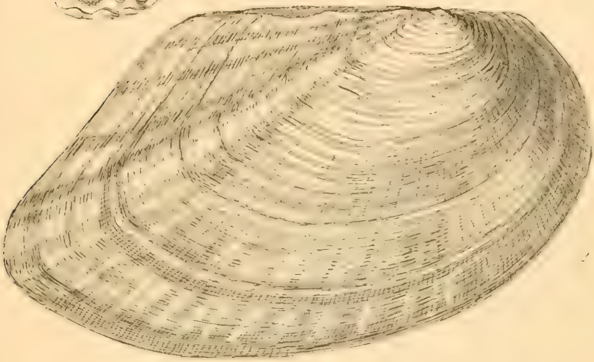
1, 2. Unio pictorum.

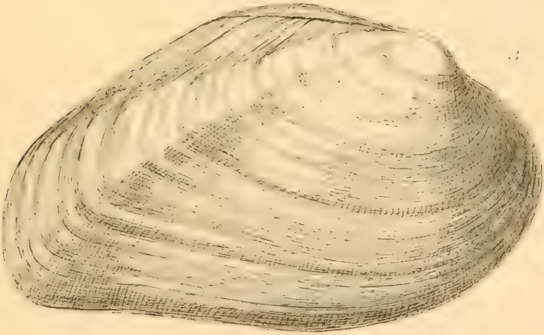
3. Anodonta cygnea, var.

PLATE XL.







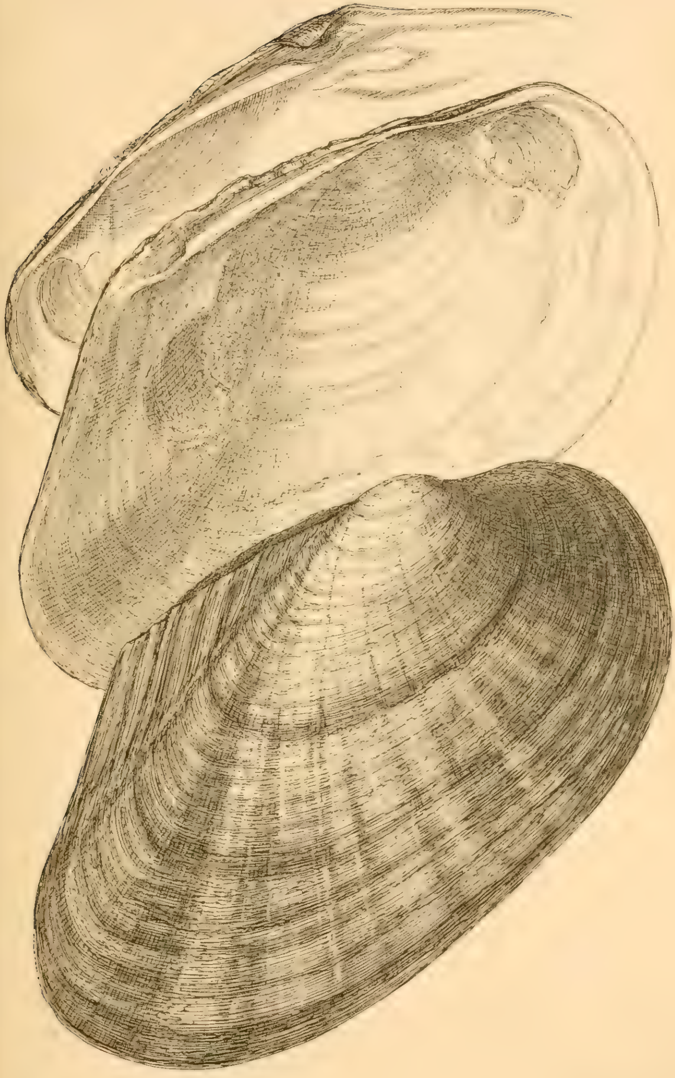


1. Unio tumidus.

2. 3. Anodonta cygnea, var.

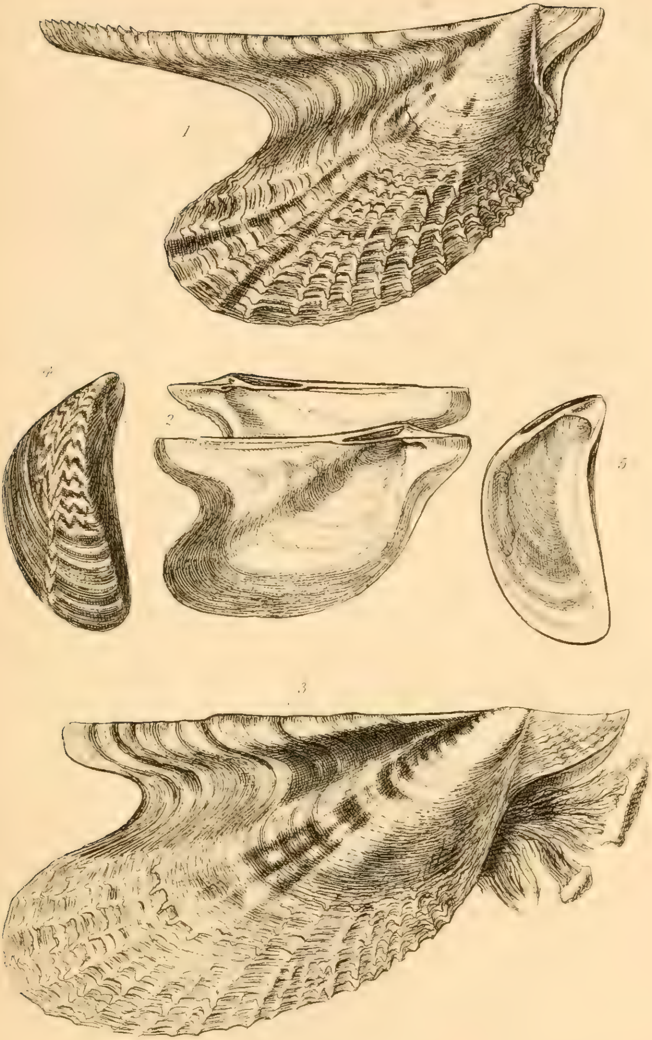
London Published by John Van Voorst, 1849.

PLATE XLI.



Anodonta cygnea.

PLATE XLII.

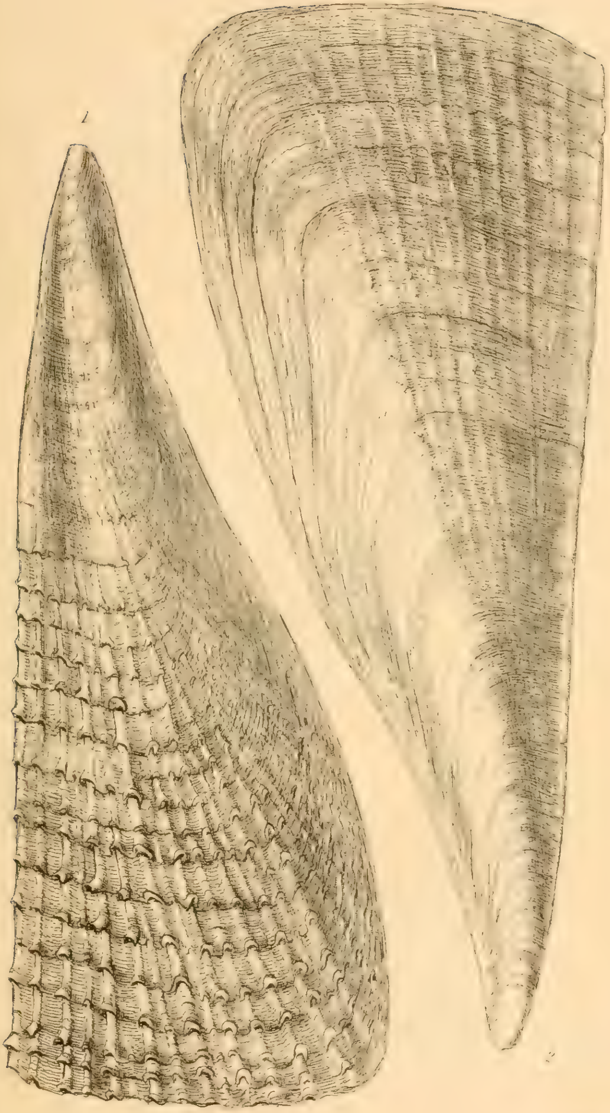


1.2.3. Avicula Tarentina.

4.5. Dreissena polymorpha.

London. Published by John Van Voorst. 1849.

PLATE XLIII.

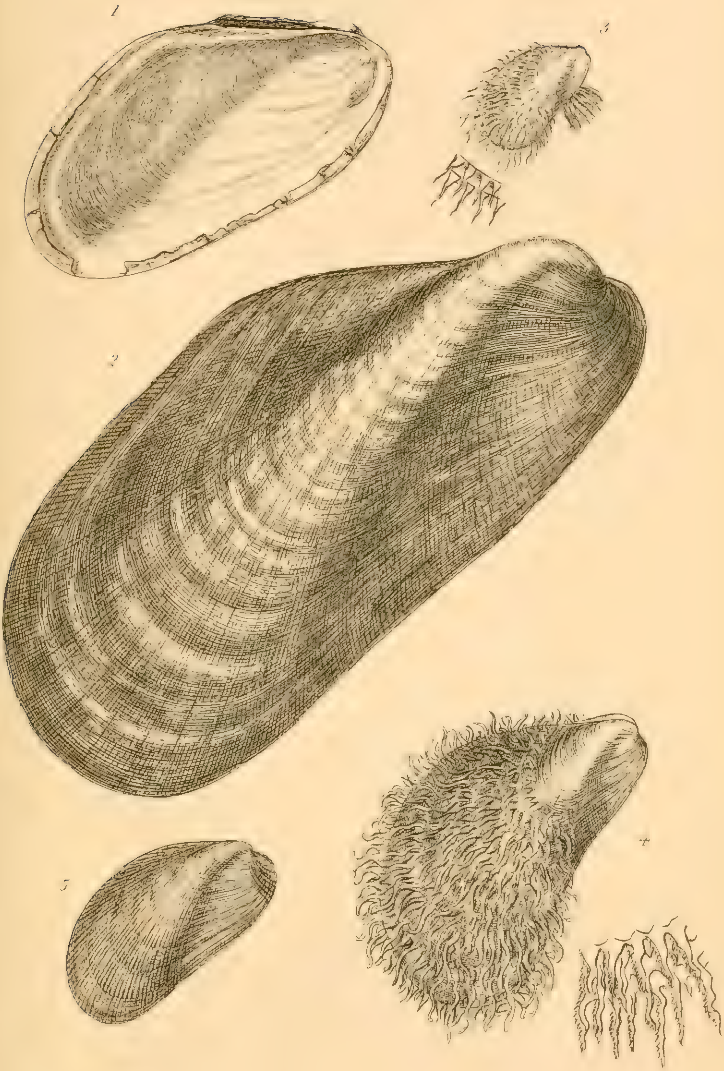


[illegible]

1.2. Pinna pectinata.

London. Published by Jo [illegible]

PLATE XLIV.

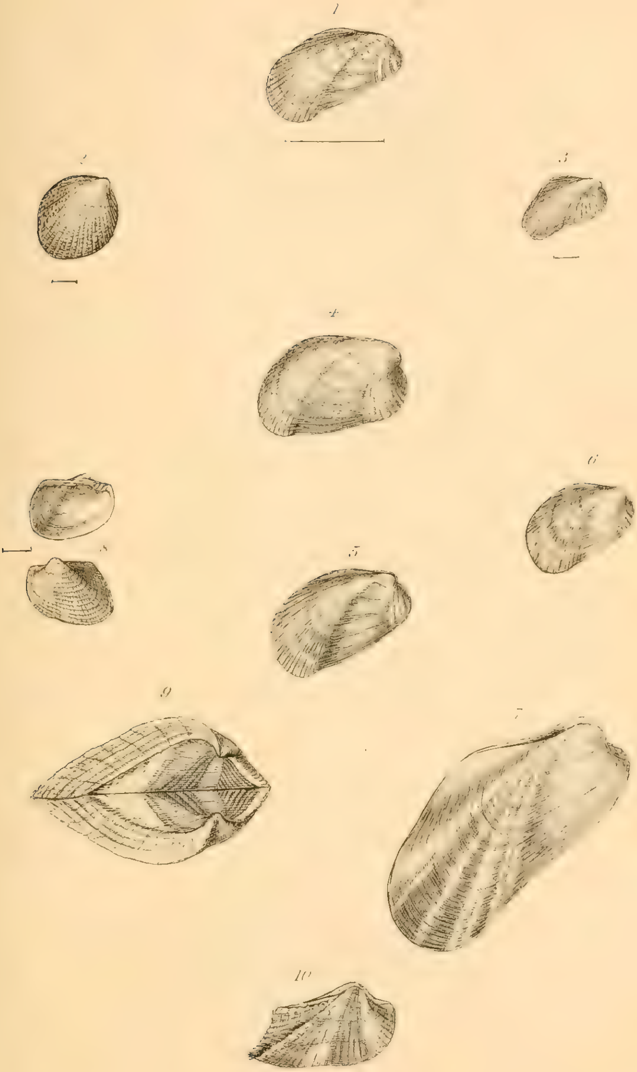


1,2. Modiola modiolus. 3. M. phaseolina.

4. M. barbata. 5. M. nigra.

London, Published by John Van Voorst, 1849.

PLATE XLV.



G.B. Sowerby. Jun.r exc

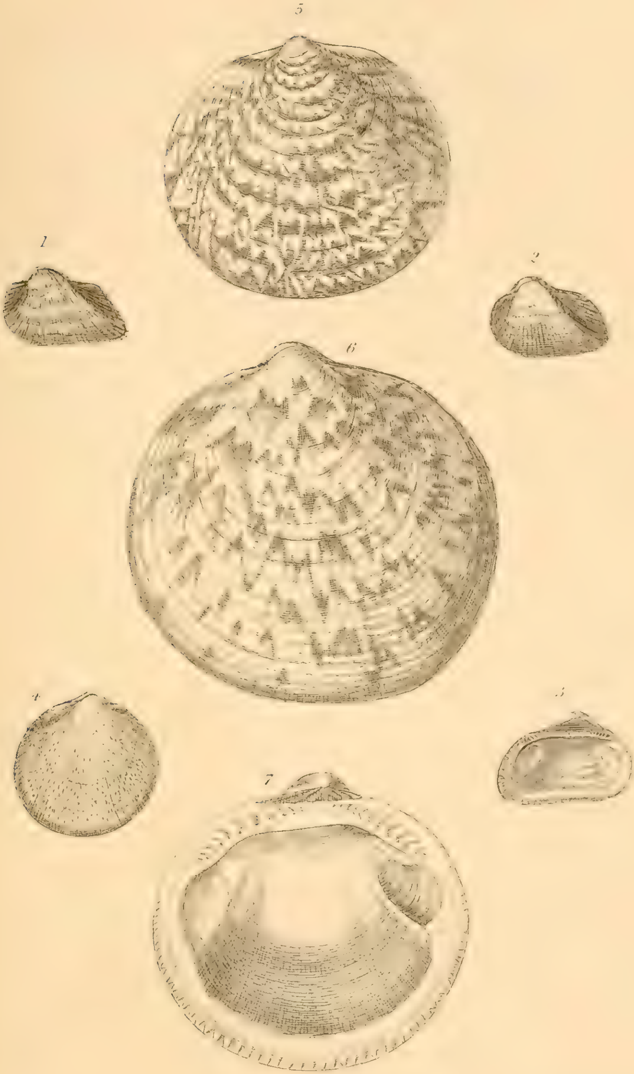
1. Crenella costulata. 2. C. decussata. 3. C. rhombea.

4. C. marmorata. 5, 6. C. discors.

7. Modiola tulipa. 8. Arca raridentata. 9. 10. A. tetragona.

London. Published by John Van Voorst, [illegible].

PLATE XLVI.



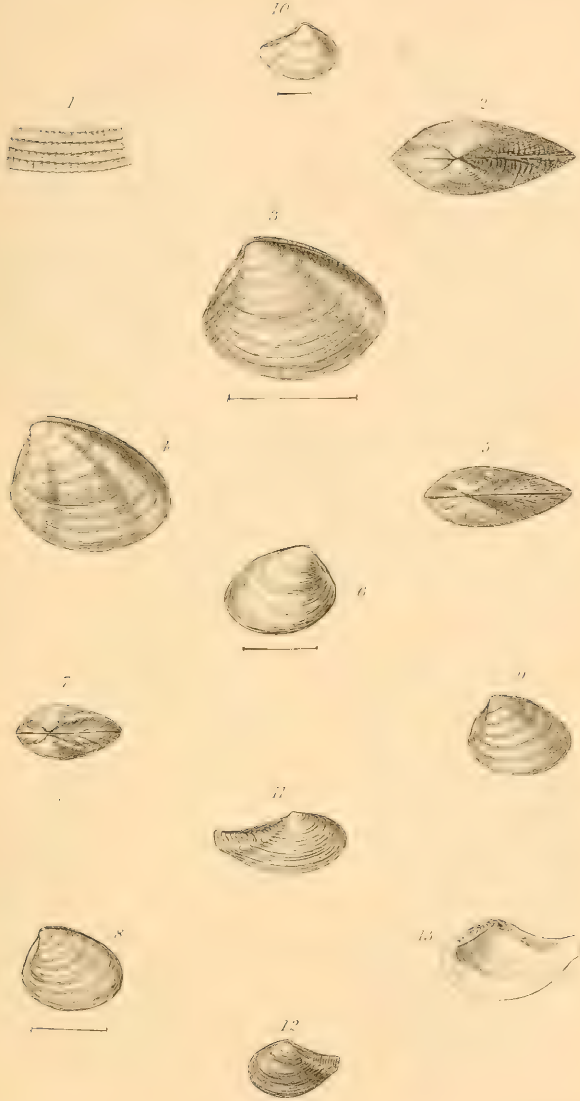
G.B. Sowerby, Jun.r exc.

1,2,3. Arca lactea.

4,5,6,7. Pectunculus glycimeris.

London, Published by John Van Voorst. 1849.

PLATE XLVII.


10
1
2
3
4
5
6
7
9
11
8
13
12

G.B. Sowerby Jun. sc.

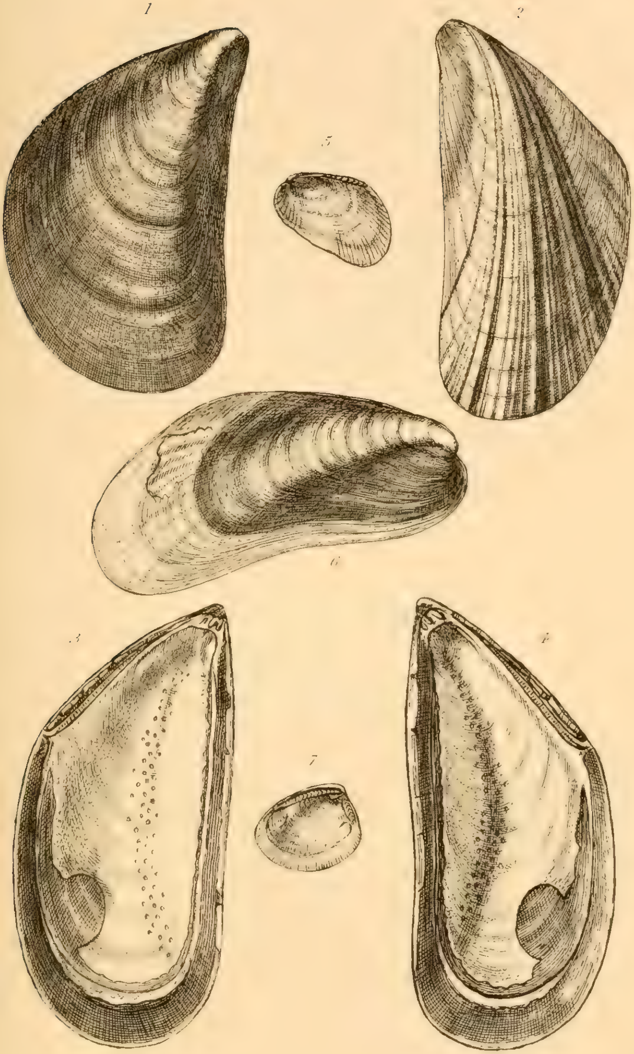
1,2,3. Nucula decussata. 4,5. N. radiata.

6. N. tenuis. 7,8. N. nucleus. 9. N. nitida.

10. Leda pygmæa. 11,12,13. L. caudata.

London. Published by John Van Voorst 1849.

PLATE XLVIII.



1.2.3.4. Mytilus edulis. 5. Crenella discors.

6. Modiola tulipa. var. 7 Nucula radiata.

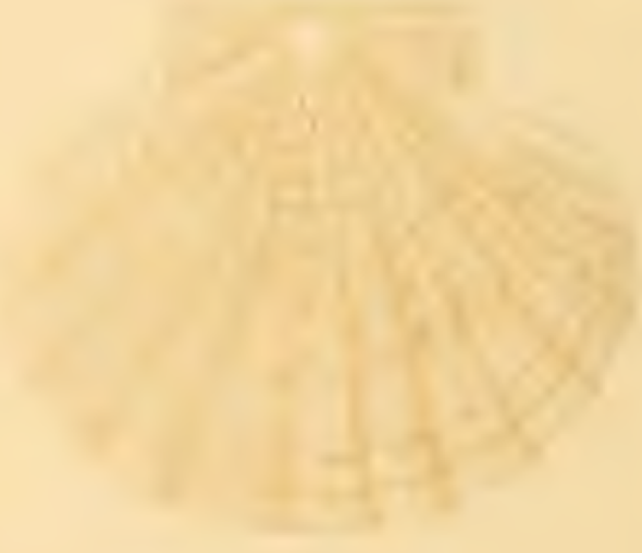
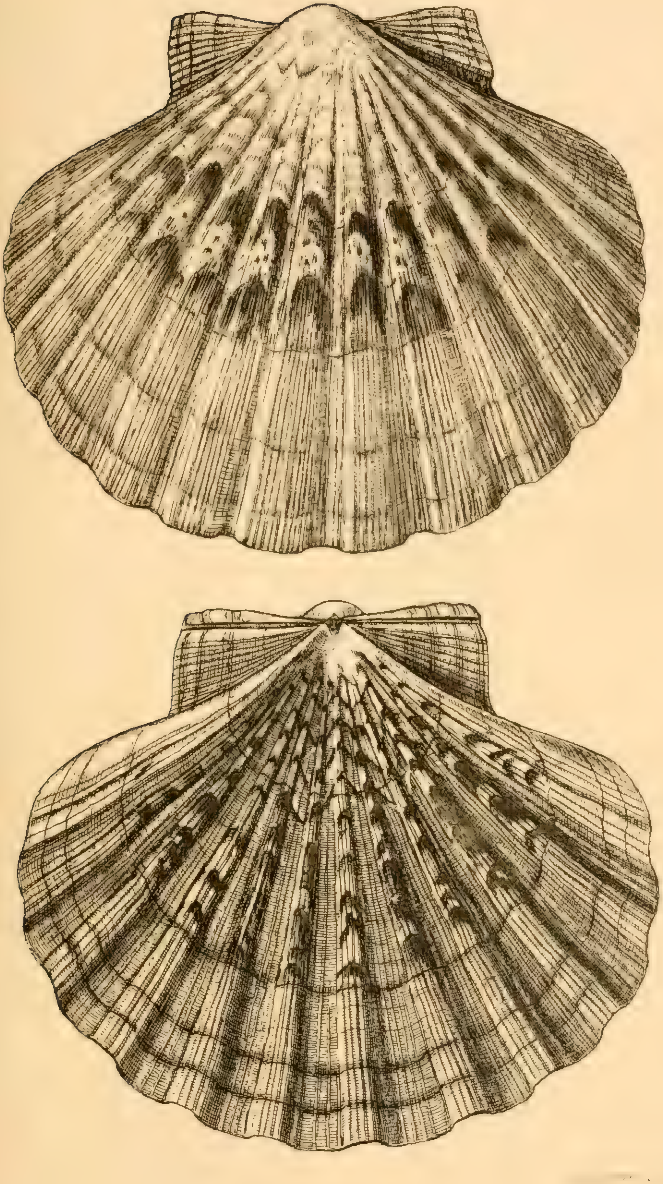


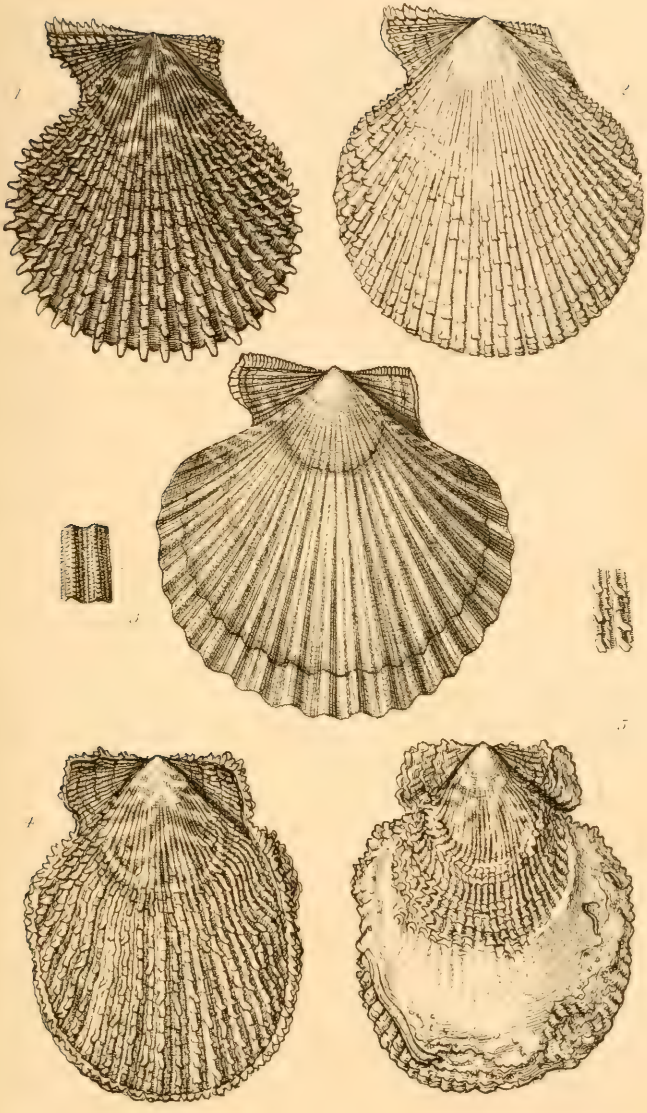
PLATE XLIX.



Pecten maximus.

London. Published by John Van Voorst, 1849

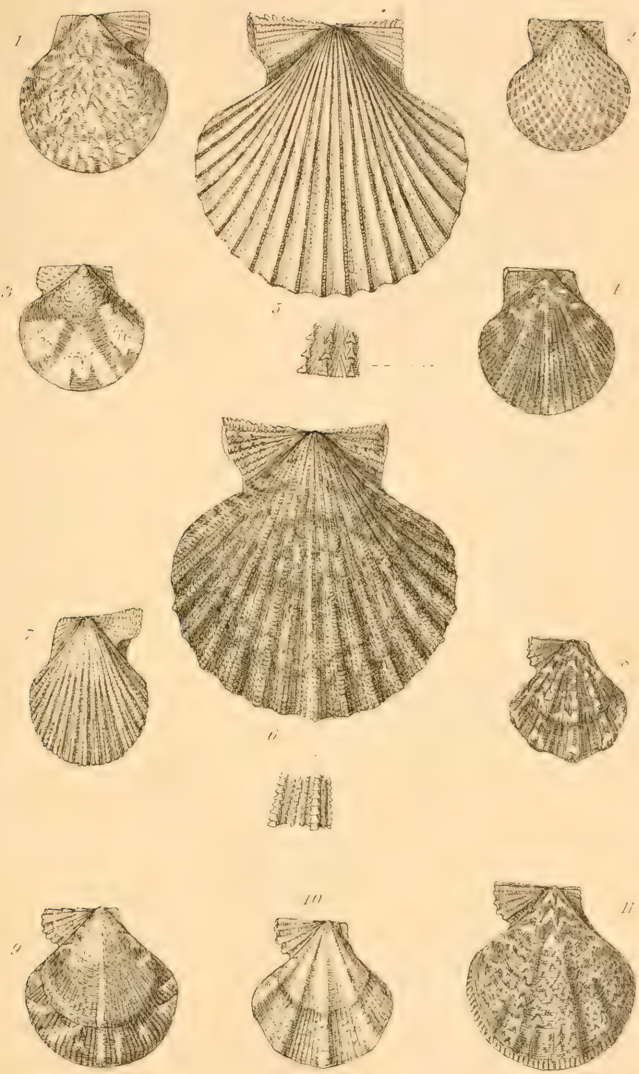
PLATE L.



1. Pecten varius. 2 P. niveus.

3. P. opercularis. 4. 5. P. pusio.

PLATE LI.

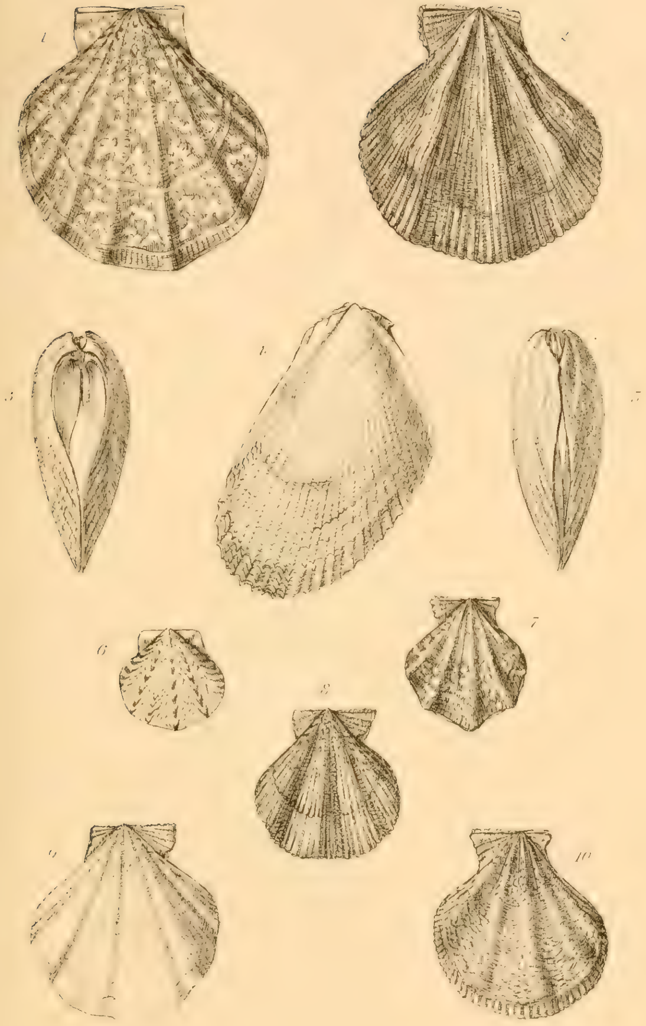

1
2
3
4
5
6
7
8
9
10
11

1.4. Pecten striatus. 2.3. do. var. furtivus.

5. P. opercularis. var. lineatus. 6. do. v. Audouini.

7. P. pusio, young. 8 to 11. P. tigrinus.

PLATE LII.



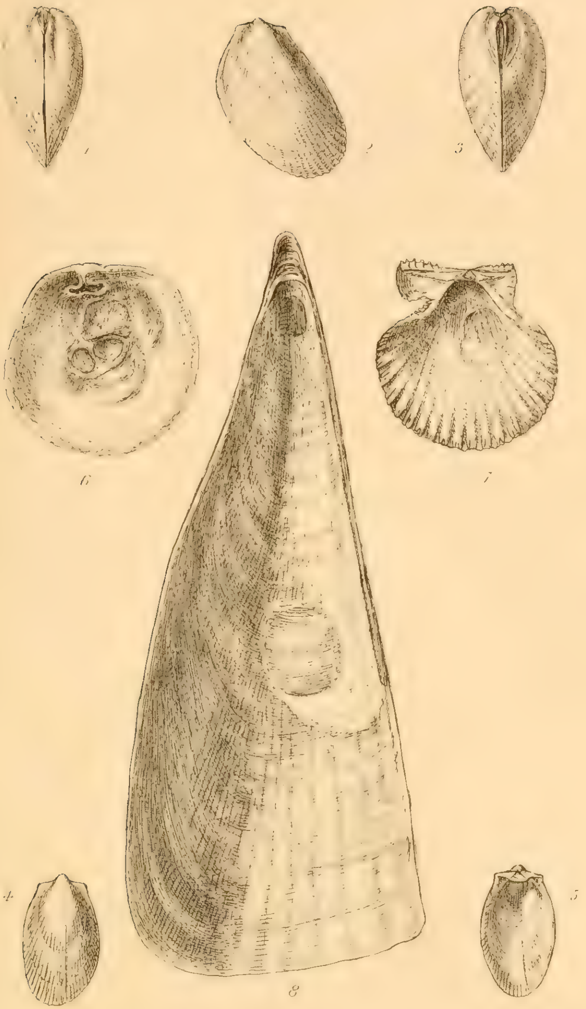
G B Sowerby Jun. exc

1.2.7.8.9.10. Pecten Danicus. 3.4.5. Lima hians.

6. P. similis. (slightly enlarged.)

London. Published by John Van Voorst, 1849

PLATE LIII.



G.B. Sowerby, Junr exc

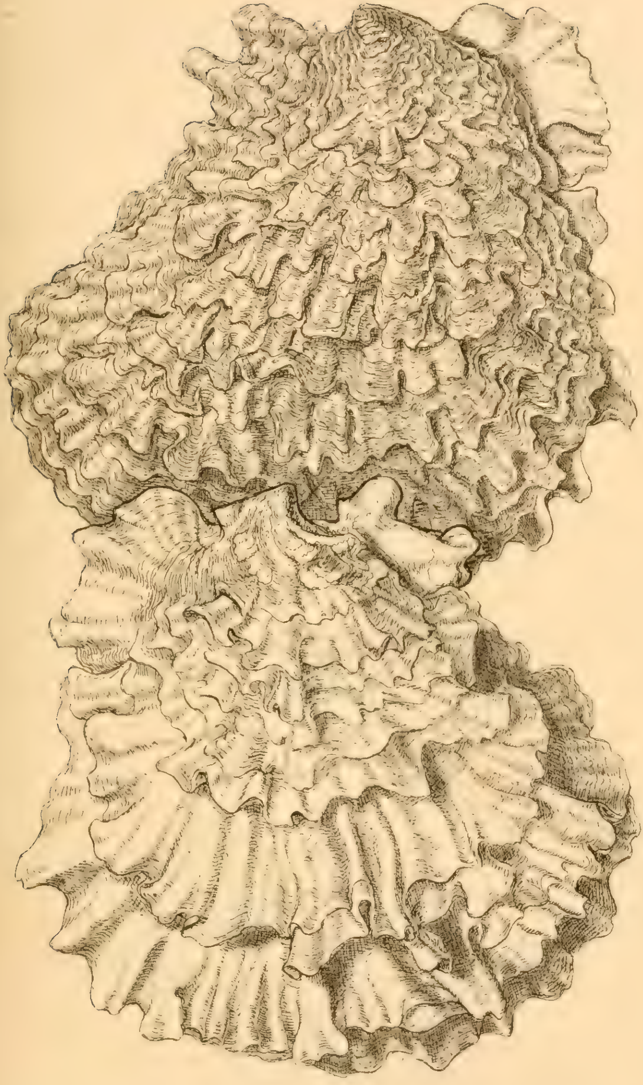
1.2.3. Lima Loscombii. 4.5. L. subauriculata.

6. Anomia striata. 7. Pecten opercularis.

8. Pinna pectinata. (diminished in size.)

London. Published by John Van Voorst. 1849

PLATE LIV.

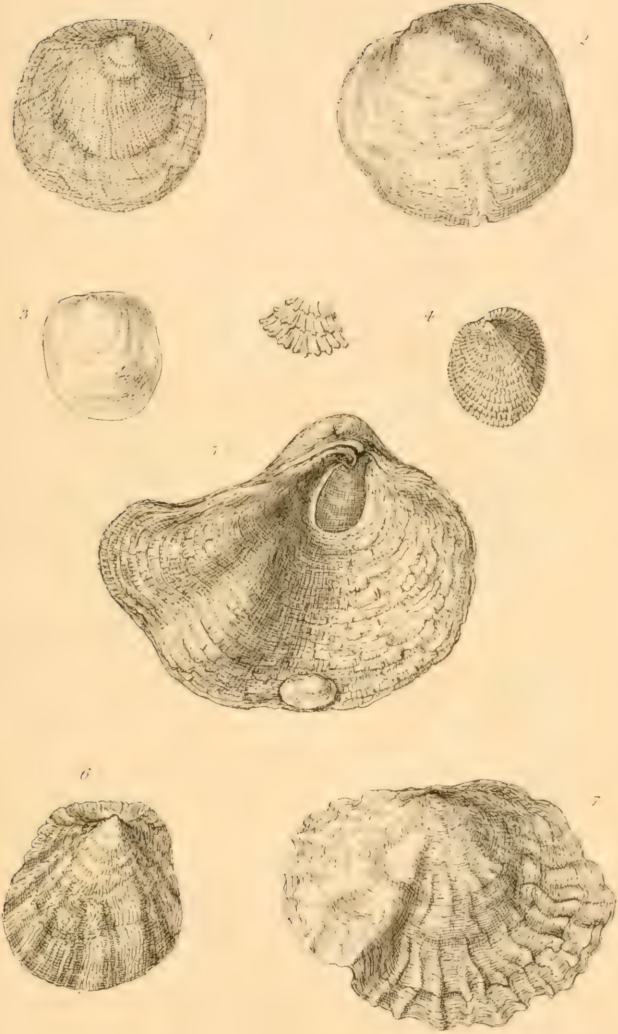


[illegible]

Ostrea edulis.

London Published by John Van Voorst 1849

PLATE LV.

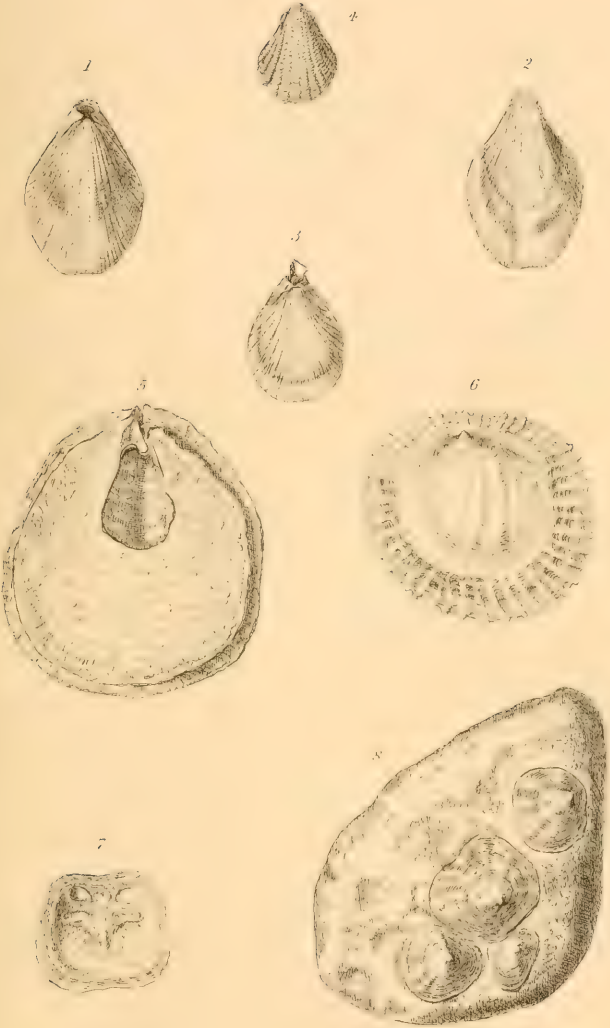


1,6. Anomia striata. 2,3.5,7. A.ephippium,

(2. var. cepa. 3.var. squamula. 7. var. electrica.)

4. A.aculeata.

PLATE LVI.



G.B Sowerby, Jun.r exc.

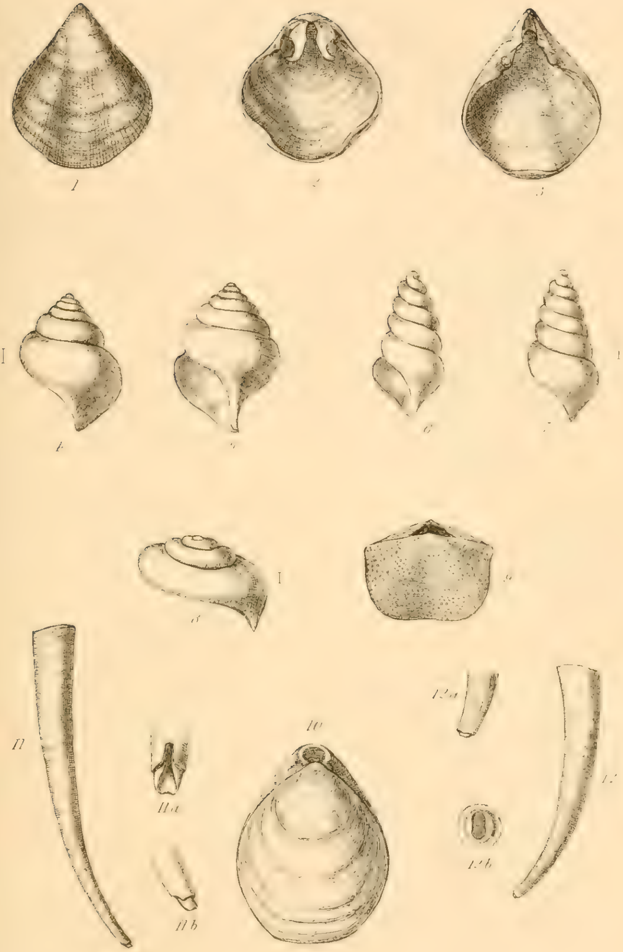
1,2,3. Terebratula caput-serpentis.

. 4. do. young, magnified.

5,6. Anomia Patelliformis. 7,8. Crania Norvegica.

London, Published by John Van Voorst, 1849.

PLATE LVII.


1
2
3
I
4
5
6
7
I
8
I
9
11
11a
11b
10
12a
12
12b

J.E. Sowerby Junr. exc

1.2.3. Hypothyris psittacea. 4.5. Spirialis Flemingii.

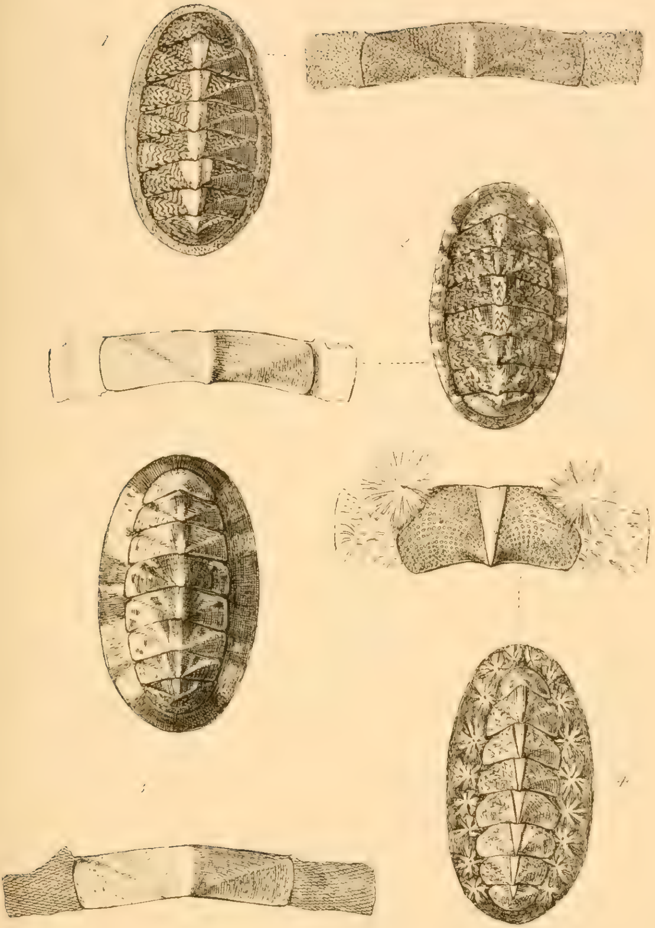
6.7. S. M'Andrii. 8. S. Jeffreysii.

9. Megathyris cistellula. 10. Terebratula cranium.

11. Dentalium entalis. 12. D. Tarentinum.

London. Published by John Van Voorst

PLATE LVIII.



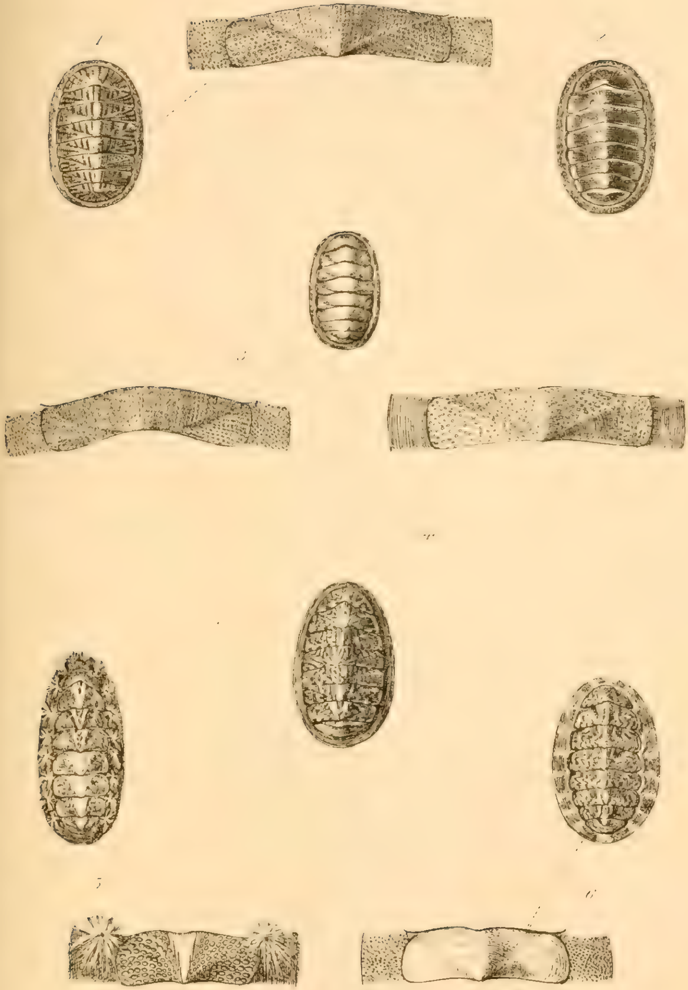
[illegible] r. Jun.r exc

1. Chiton marginatus. 2. C. marmoreus.

3. C. lævis. 4. C. discrepans.

[illegible] ed by John Van Voorst. 1843

PLATE LIX.



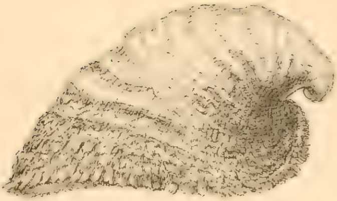
1.2. Chiton asellus. 3. C. cancellatus

4. C. marmoreus var. 5. C. fascicularis. 6. C. ruber.

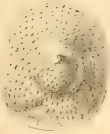
London Published by [illegible]

PLATE LX.

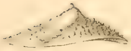
1



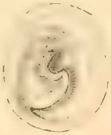
3



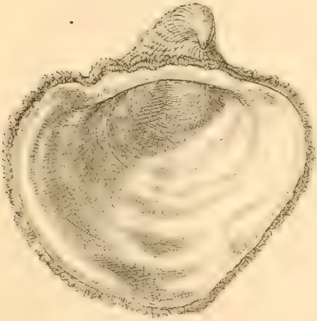
4



5



2

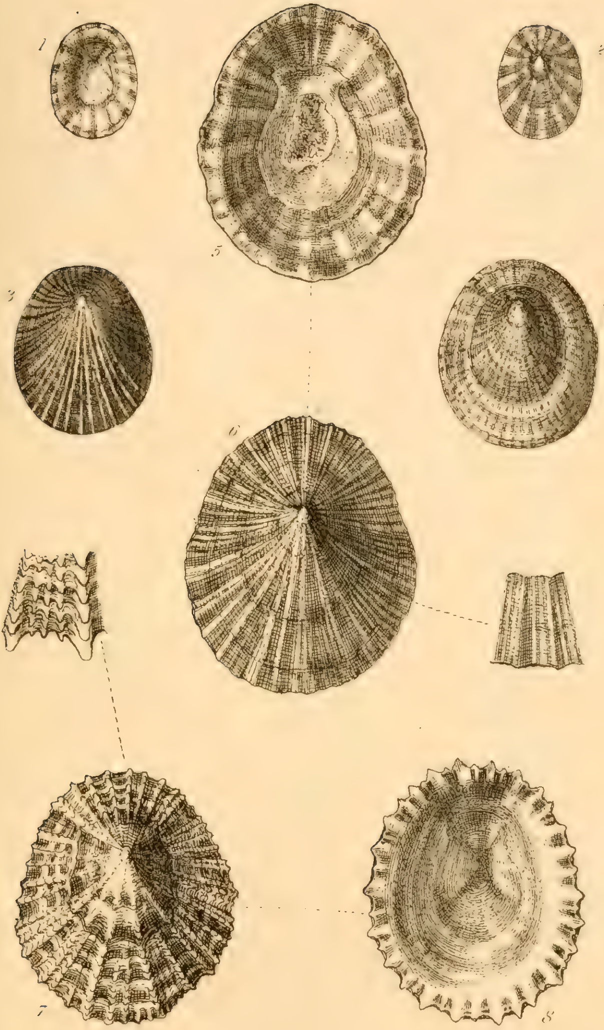


1. 2. Capulus Hungaricus.

3. 4. 5. Calyptræa Sinensis.

London. Published by John Van Voorst. 1840.

PLATE LXI.



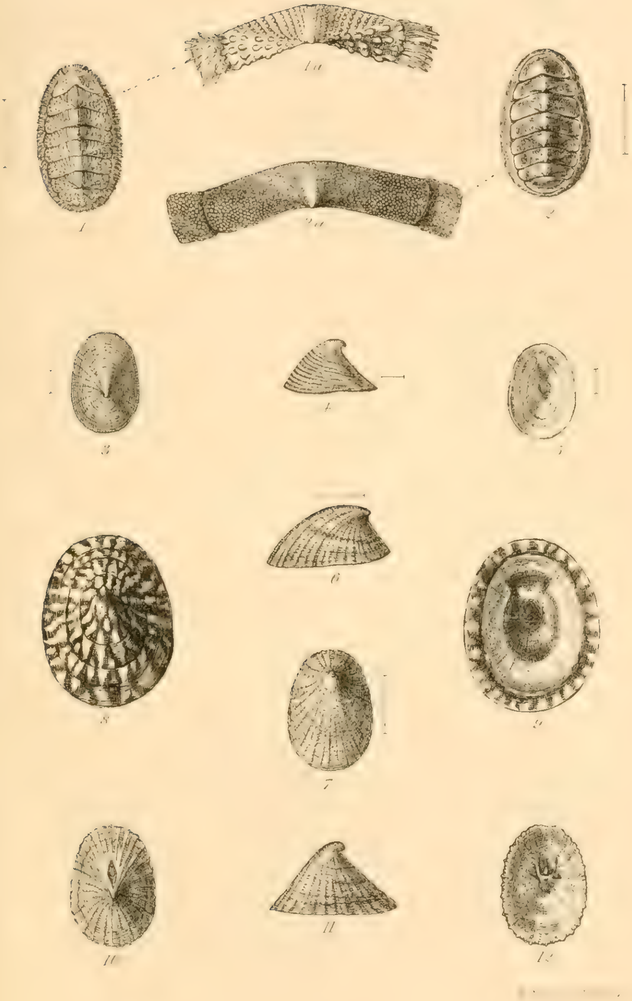
G B Sowerby. Junr. exc

1.2. Acmæa virginea. 3.4. Patella pellucida.

5.6. P. vulgata. 7.8. P. athletica.

London. Published by John Van Voorst. 1849

PLATE LXII.


1a
1
2a
2
3
4
5
6
8
9
7
10
11
12

1. Chiton Hanleyi; ^{a}. fifth valve.

2. ——— albus; ^{a}. fifth valve.

3, 4, 5. Propilidium Ancyloide.

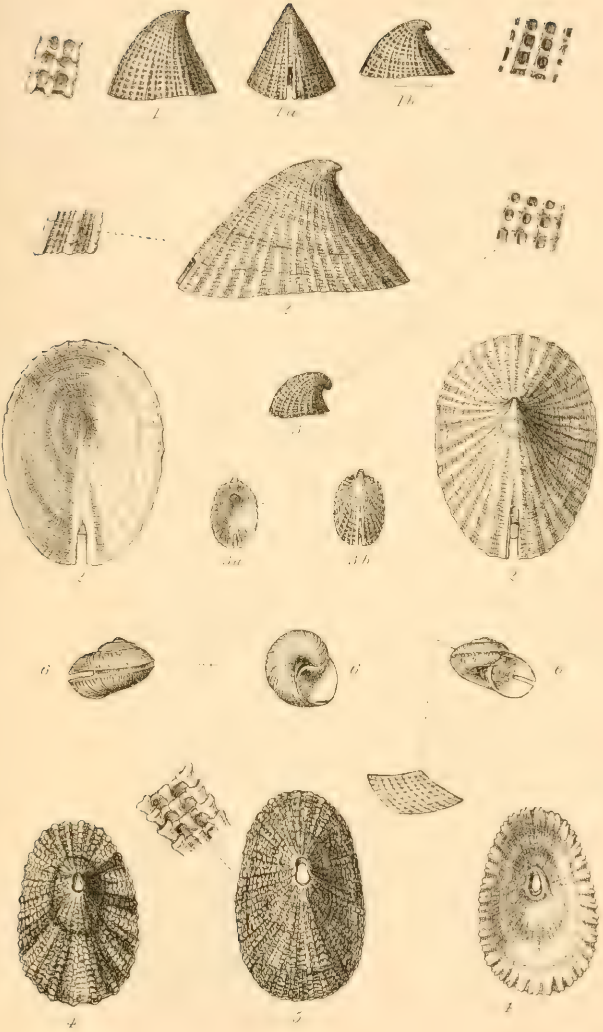
6, 7. P. fulvum.

8, 9. Acmæa testudinalis.

10, 11, 12. Puncturella Noachina.

London, Published by John Van Voorst, 1849

PLATE LXIII.


1
1 a
1 b
2
3
3 a
3 b
2
6
6
6
4
5
4

G.B. Sowerby, Jun.

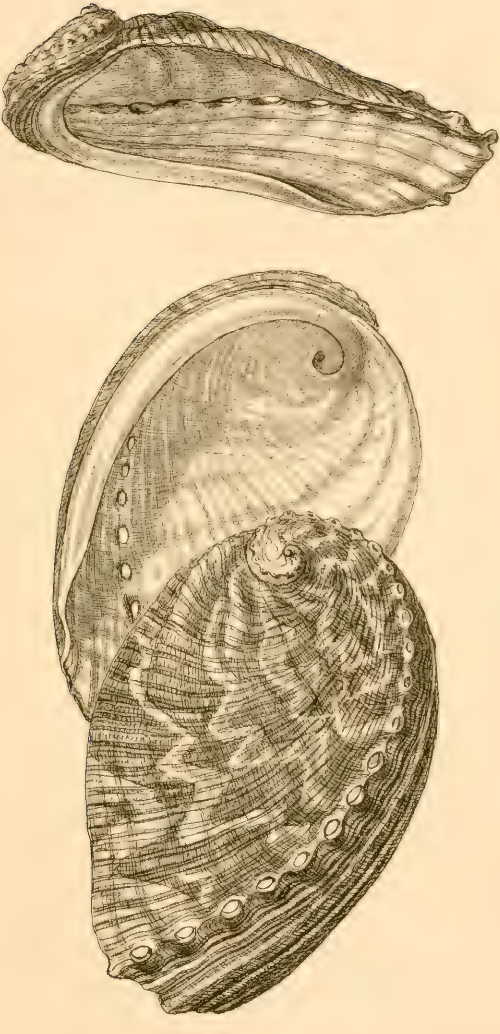
1. Emarginula Mülleri. 1 b, young. 2 E. crassa.

3, 3 a, 3 b, E. rosea.

4.5. Fissurella reticulata. 6. Scissurella crispata.

London Published by John Van Voorst, 1849

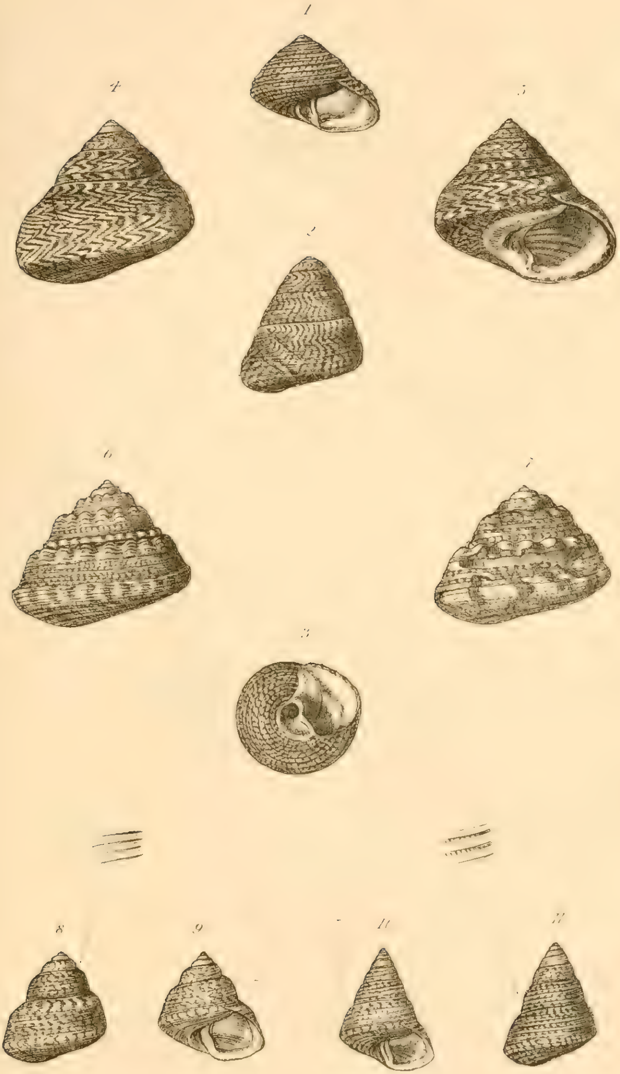
PLATE LXIV.



Haliotis tuberculata.

London. Published by John Van V

PLATE LXV.

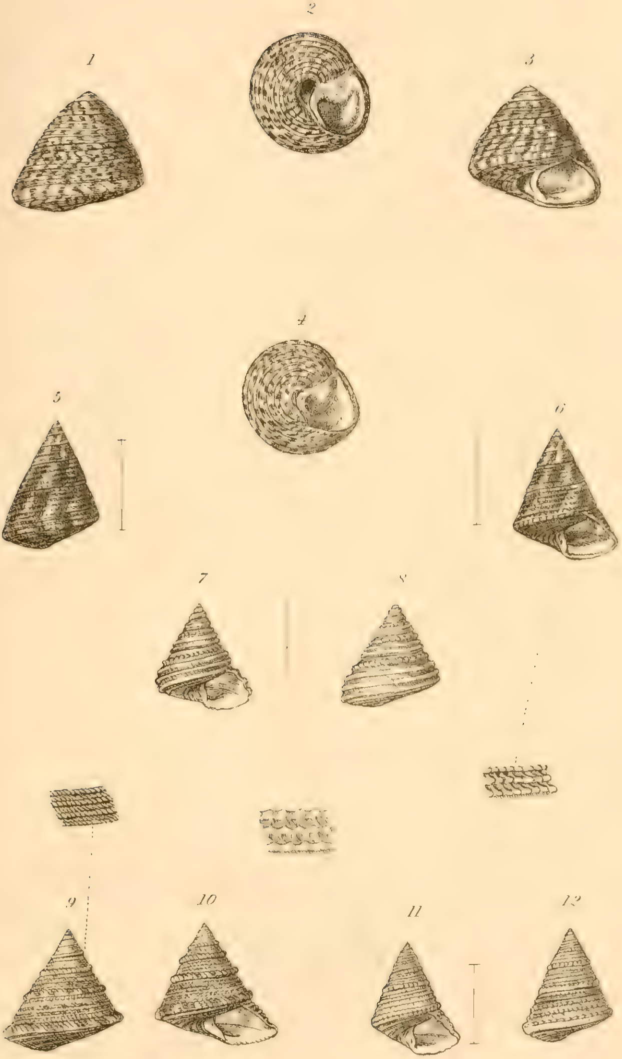

1
4
5
2
6
7
3
8
9
10
11

1.2.3. Trochus cinerarius. 4.5. T. crassus.

6.7. T. Magus. 8.9. T. tumidus. 10.11. T. Montagui.

London. Published by John Van [illegible]

PLATE LXVI.

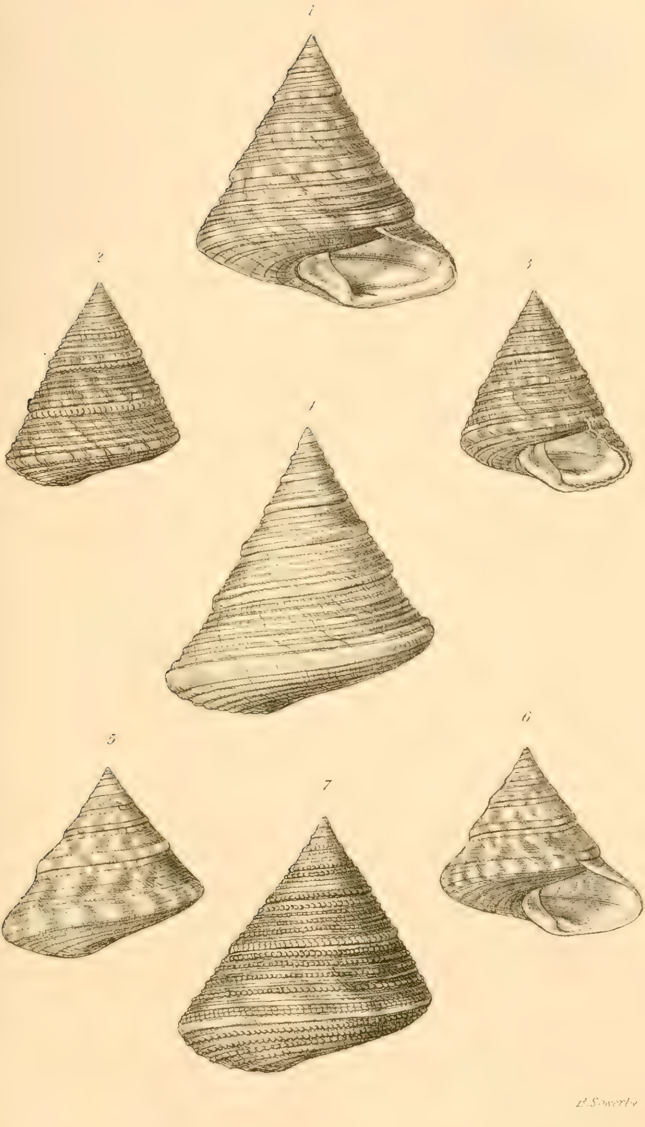

2
1
3
4
5
6
7
8
9
10
11
12

1 to 4. Trochus umbilicaris. 5,6. T. striatus.

7,8. T. formosus. 9,10. T. millegranus. 11,12. T. exiguus.

ndon. Published by John Van Voorst.

PLATE LXVII.



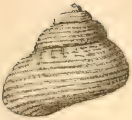
B. Sowerby

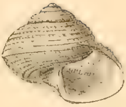
1 to 6, Trochus zizyphinus. (4 var. Lyonsii; 5,6. var. lævis.

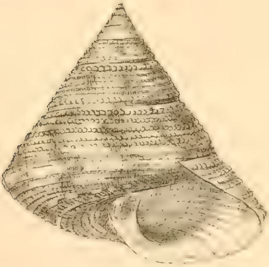
7. T. granulatus.

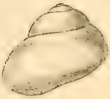
London, Published by Joh.

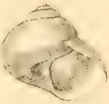
PLATE LXVIII.

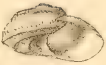
1


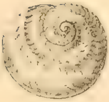
2


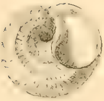
3


4


5


6


7


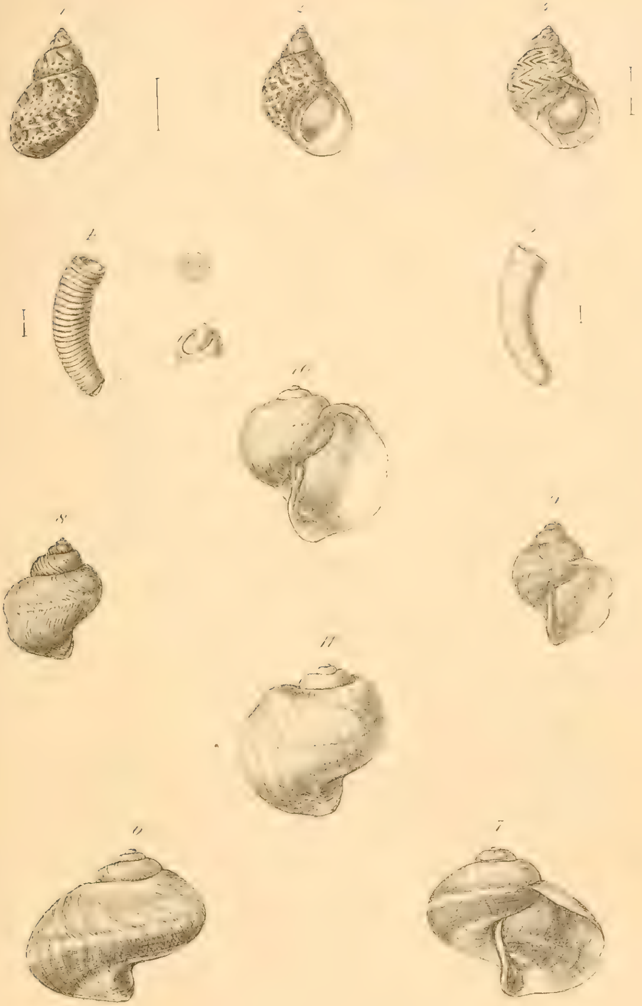
8


1, 2. Trochus undulatus. 3, T. granulatus. 4.5. T. Helicinus.

6, 7, 8. Adeorbis subcarinatus.

London, Published by John Van Voorst

PLATE LXIX.



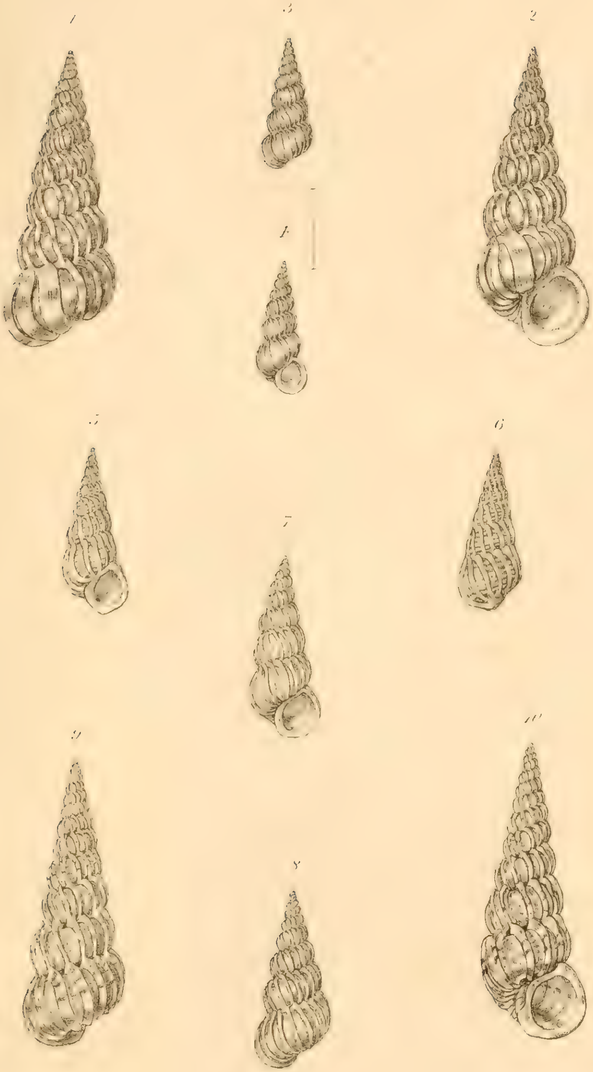
1. 2. 3. Phasianella pullus. 4. Cæcum trachea

5. C. glabrum. 6. 7. Ianthina communis.

8. 9. I. exigua. 10. 11. I. pallida

London, Published by John Van Voorst. 1849.

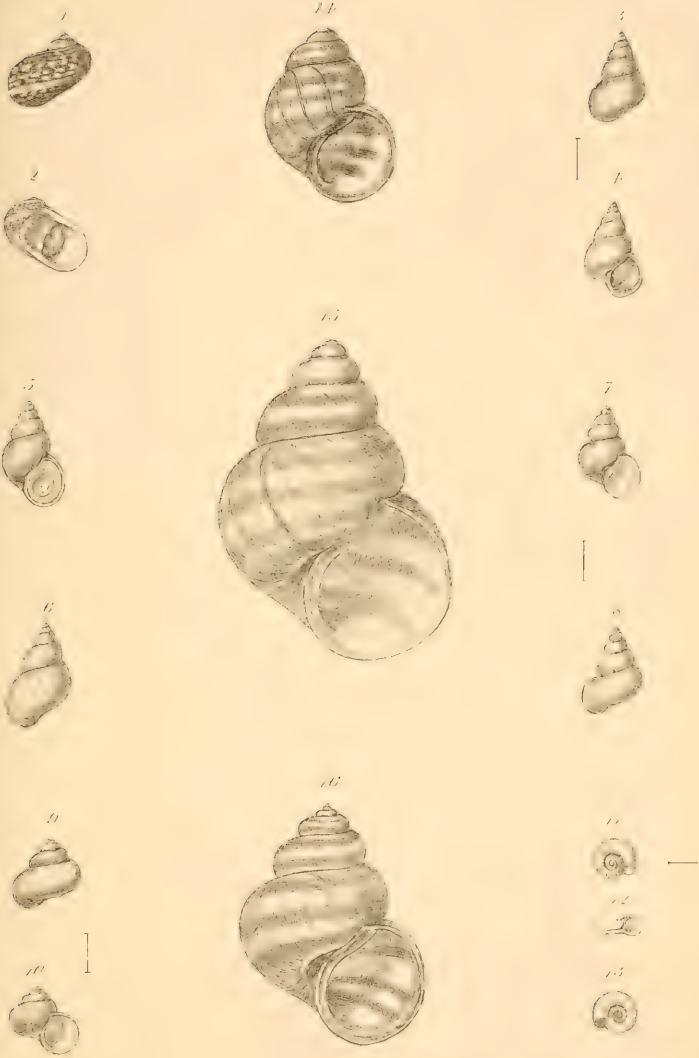
PLATE. LXX.



1, 2. Scalaria Turtonis. 3, 4. S. clathratula. 5, 6. S. Grœnlandica.

7. 8. S. Trevelyana. 9. 10. S. communis.

London. Published by John Van Voorst. 1849


1
14
3
2
4
15
5
7
6
8
16
9
11
12
10
13

1, 2. Neritina fluviatilis. 3. 4. Assiminea Grayana.

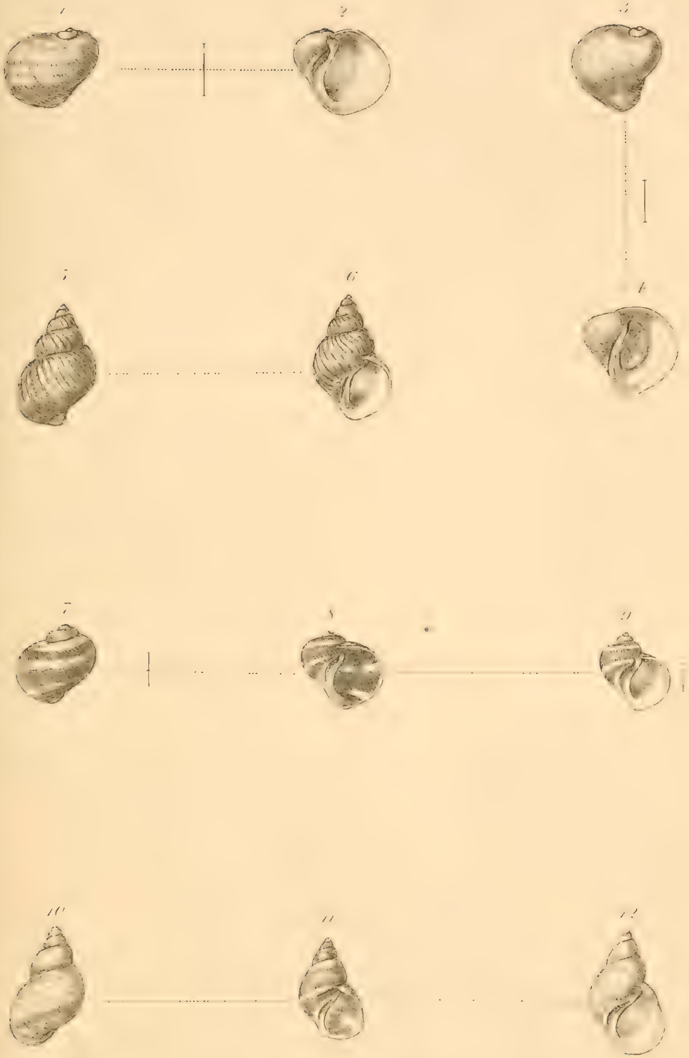
5. 6. Bithinia tentaculata. 7. 8. B. Leachii. 9. 10. Valvata piscinalis.

11. 12. 13. V. cristata. 14. 15. Paludina vivipara. Lin.

16. P. Listeri (vivipara, Mil.)

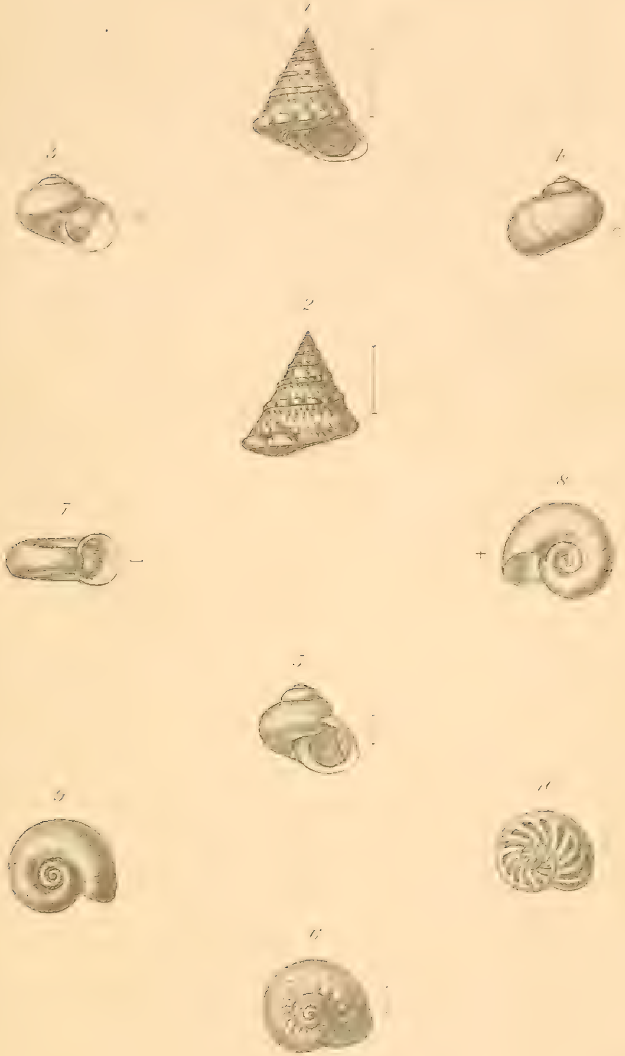
London, Published by John Van Voorst, 1849

PLATE LXXII.


1
2
3
4
5
6
7
8
9
10
11
12

1. 2. Lacuna pallidula. 3. 4. L. patula. 5. 6. L. crassior.
7. 8. 9. L. puteolus. 10. 11. 12. L. vincta.

London, Published by John Van Voorst, 1849



G. B. Sowerby Junr. exc

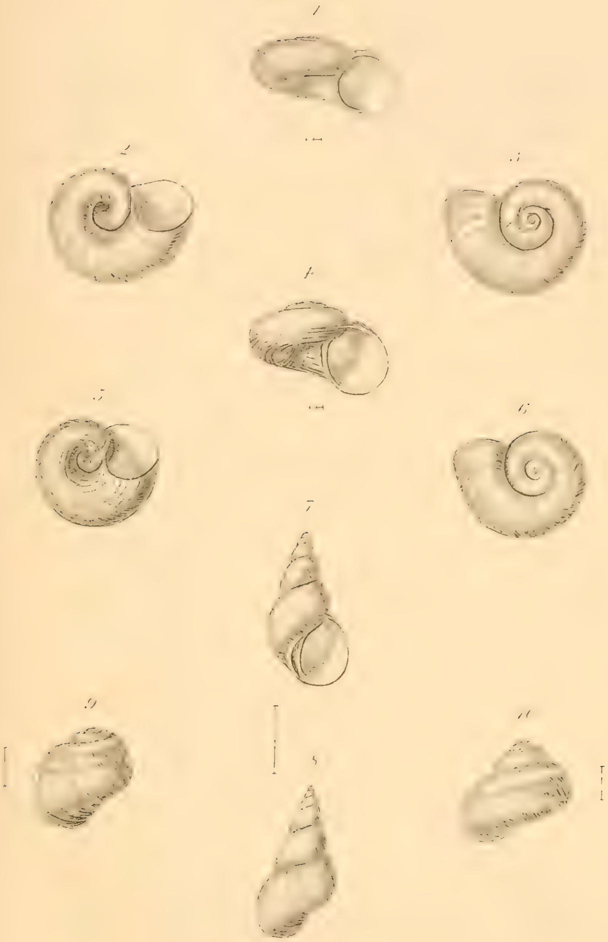
1. 2. Trochus conulus. 3. 4. T. (Marg.) pusillus.

5. 6. T. (Marg.) undulatus, var.

7. 8. 9. Skenea nitidissima. 10. S. rota.

London, Published

PLATE LXXIV.



G. B. Sowerby [illegible]

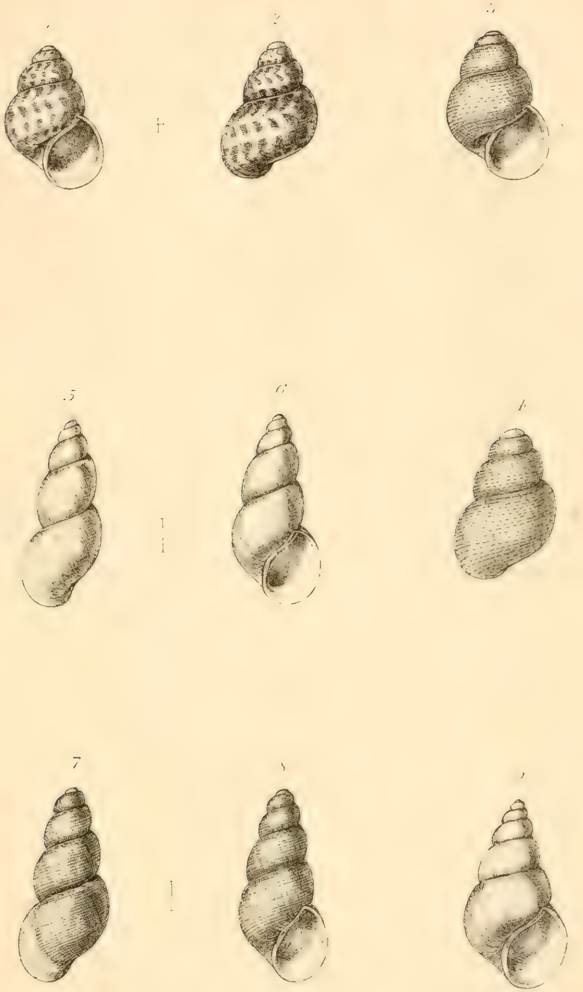
1, 2, 3. Skenea planorbis. 4, 5, 6. S. divisa.

7, 8. Lacuna vincta. var. gracilis. 9. L. puteolus.

10. Troch. (Marg.) Helicinus.

London Published by John Van Voorst. 1850.

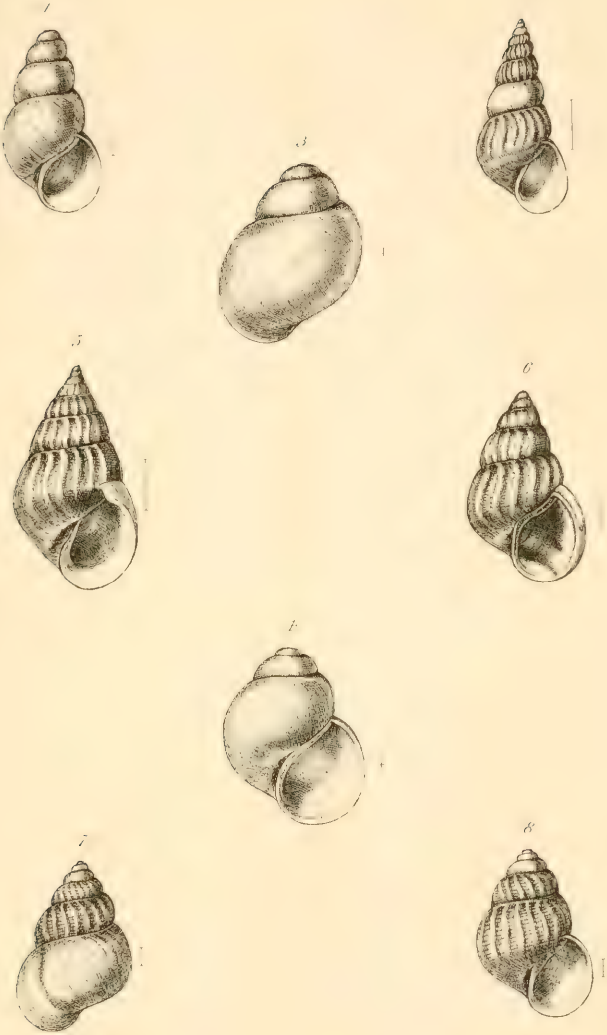
PLATE LXXV



1. 2. Rissoa pulcherrima. 3. 4. R. soluta.
5. 6. R. vitrea. 7. 8. R. proxima.
9. R. pellucida of Bean.

London Published by John Van Voorst. 1850.

PLATE LXXVI.

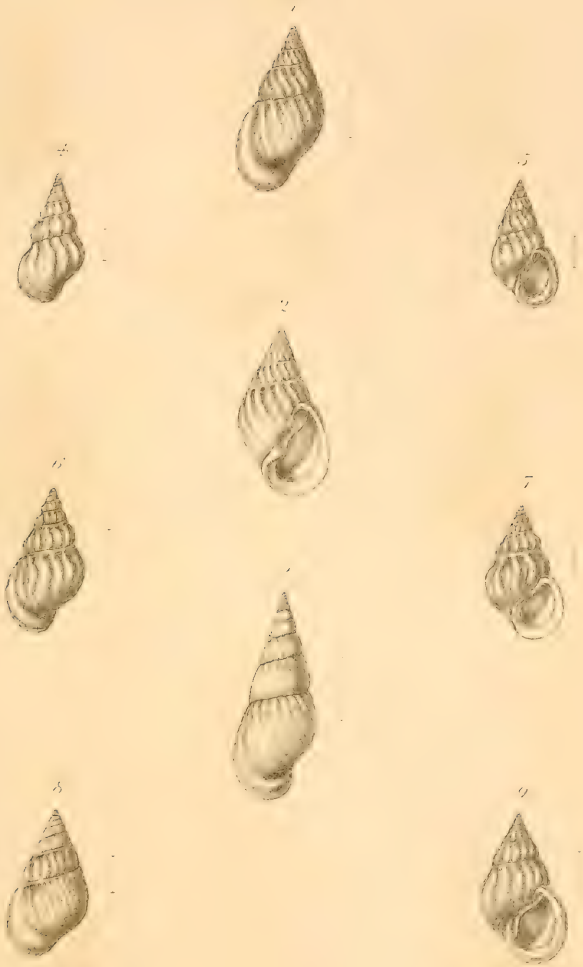


1. Jeffreysia diaphana. 2. Rissoa parva, var. discrepans.

3. 4. J. opalina 5. R. labiosa var. venusta. 6. R. parva

7. 8. R. inconspicua. var. albula.

PLATE LXXVII.

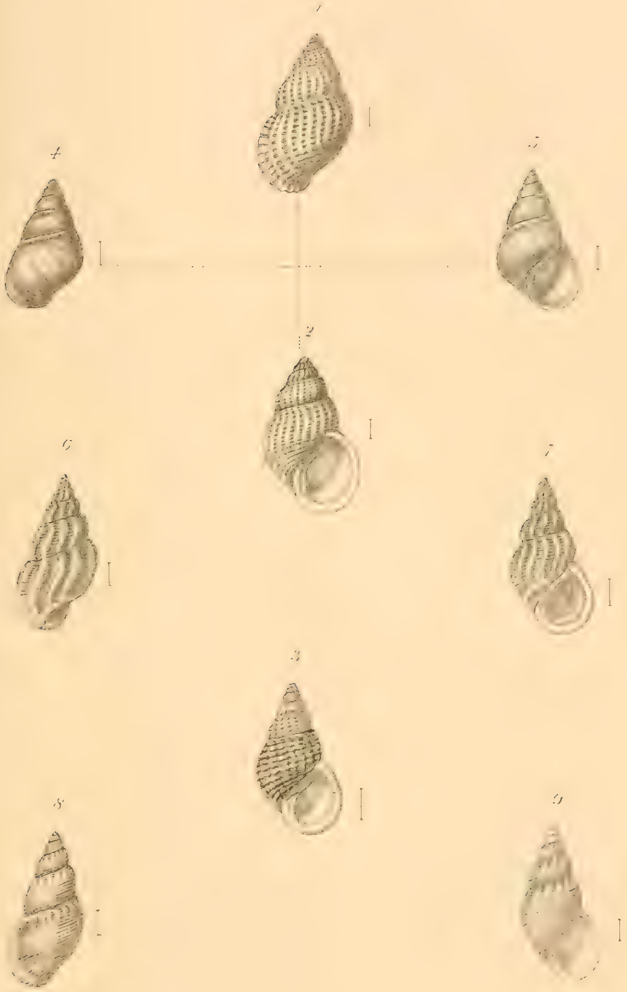


1.2.3. Rissoa labiosa. 4.5. R. costulata.

6.7. R. parva. 8.9. R. rufilabrum.

London Lovell Reeve &

PLATE LXXVIII



[illegible]

1. 2. Rissoa abyssicola. 3. R. calathus.

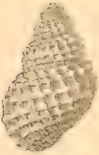
4. 5. R. rubra. 6. 7. R. costata.

8. 9. R. striata.

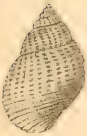
London. Published by John Van Voorst. 1850.

PLATE LXXIX.

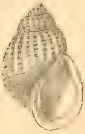
1



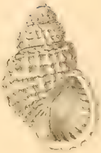
3



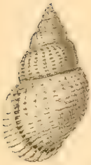
4



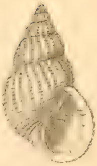
2



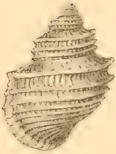
5



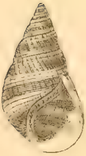
6



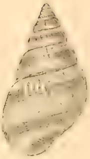
7



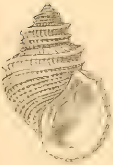
9



10



8



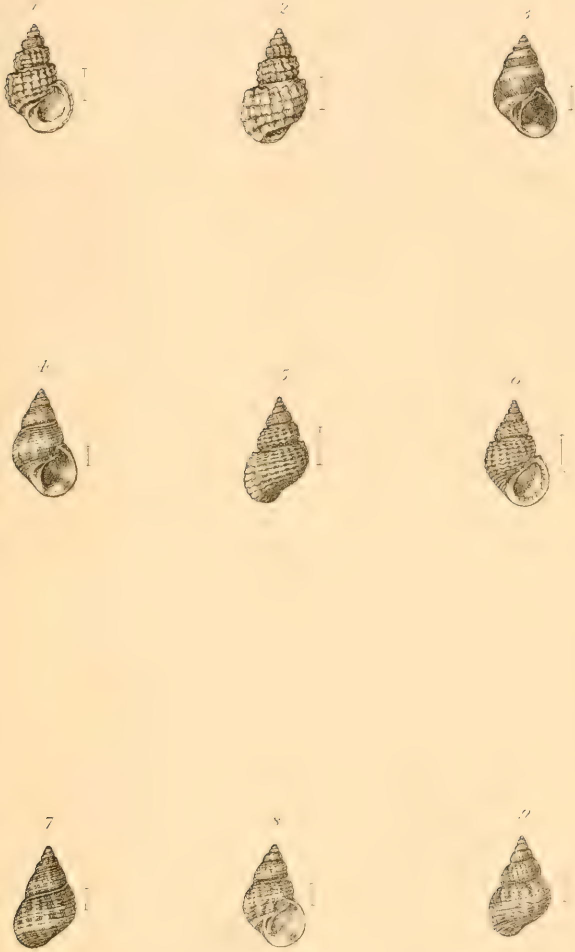
1. 2. Rissoa crenulata. 3. 4. R. lactea.

5. 6. R. Beanii. 7. 8. R. striatula.

9. 10. R. cingillus.

London. Published by John Van Voorst 1850.

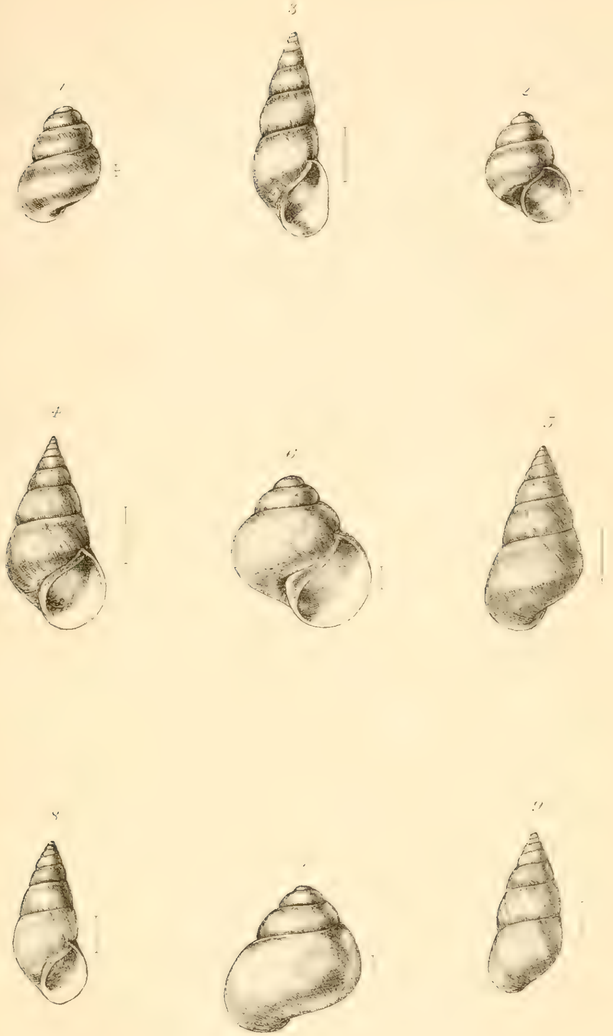
PLATE LXXX.



1. 2. Rissoa Zetlandica. 3. R. rubra.
4. 7. R. semistriata. 5. 6. R. sculpta.
8. 9. R. punctura.

London. Published by John Van Voorst. 1850

PLATE LXXXI.



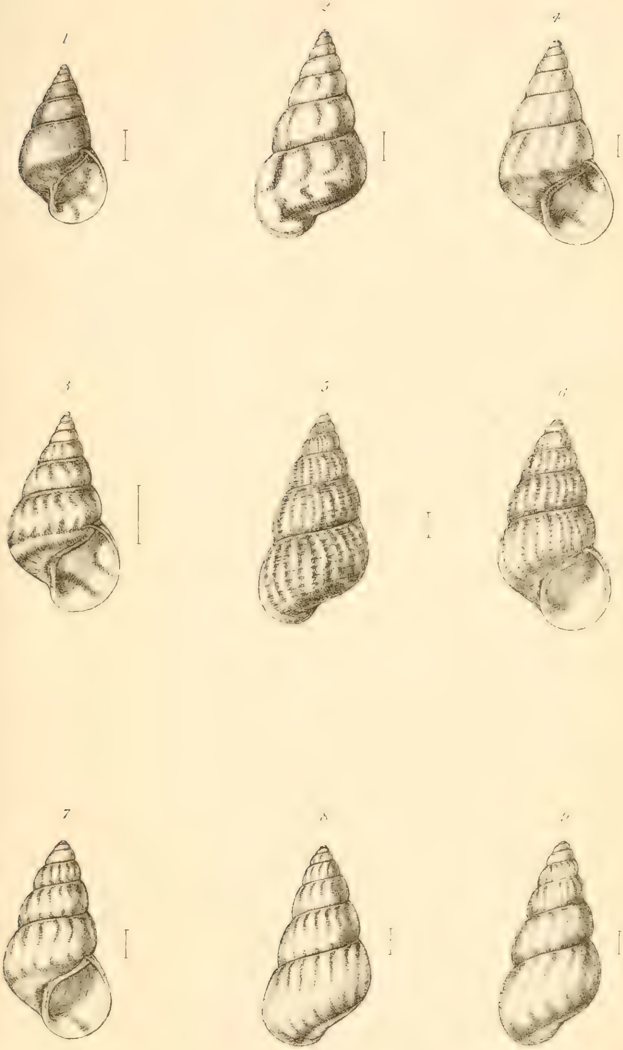
1. 2. Rissoa fulgida.

3. R. labiosa var gracilis. 4. 5. R. ulvæ. 6. 7. R. (?) littorea.

8. 9. R. ulvæ var Barleei.

London Published by John Van Voorst.

PLATE LXXXII.

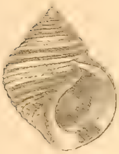


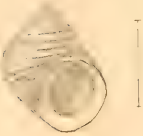
1 to 4. Rissoa parva.

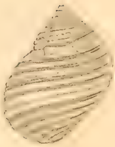
5 to 9. R. inconspicua.

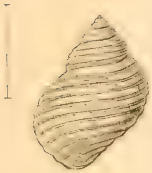
London. Published by John Van Voorst. 1850.

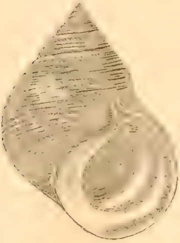
PLATE LXXXIII.

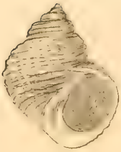
1


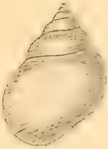
7


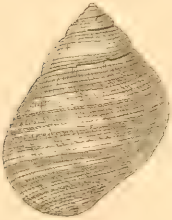
2


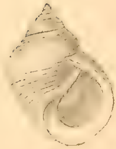
3


8


4


5


9


6


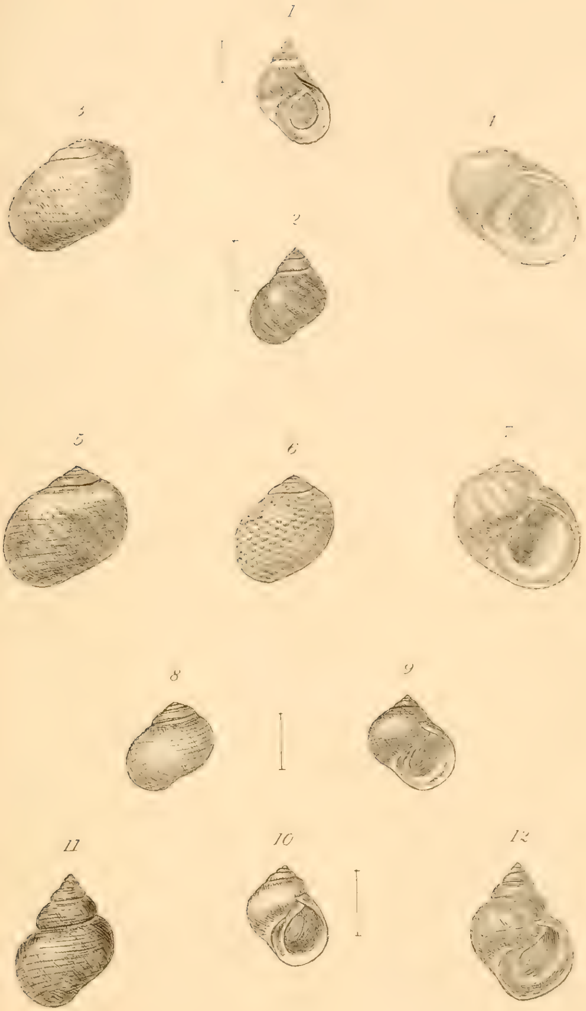
G B Sowerby Jun.r [illegible]

1. 2. Litorina rudis, var. nigrolineata. 3. 5. 6. 7. L. rudis.

4. L. tenebrosa, var. intermedia. 8. 9. L. litorea.

London. Published by John Van Voorst. 1850.

PLATE LXXXIV.


1
3
1
2
5
6
7
8
9
11
10
12

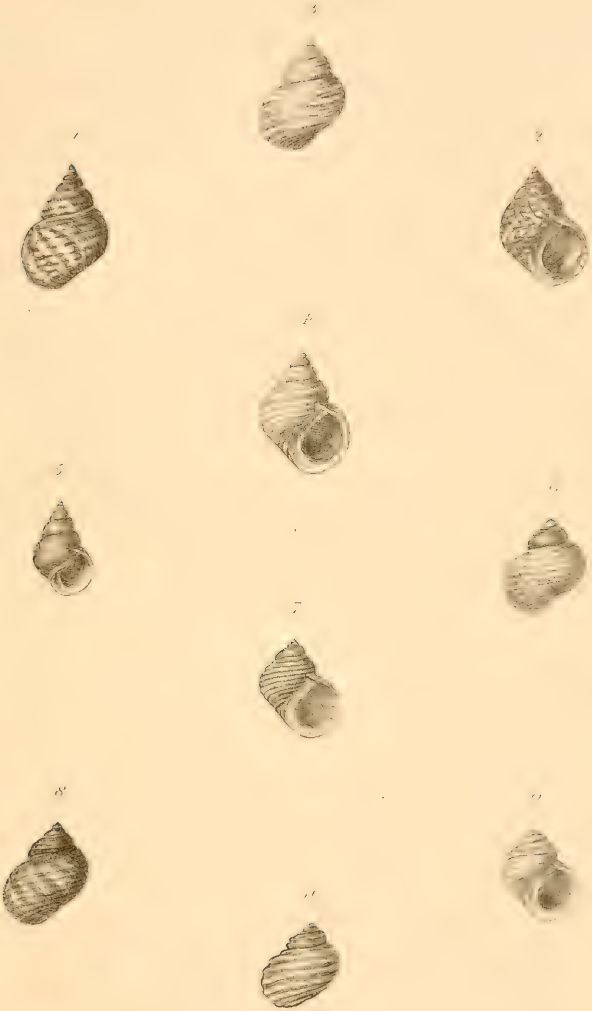
G. B. Sowerby Jun.r exc.

1. 2. Litorina Neritoides. 3 to 7. L. litoralis.

8. 9. 10. L. palliata. 11. 12. L. tenebrosa.

London. Published by John Van Voorst. 1850.

PLATE LXXXV.

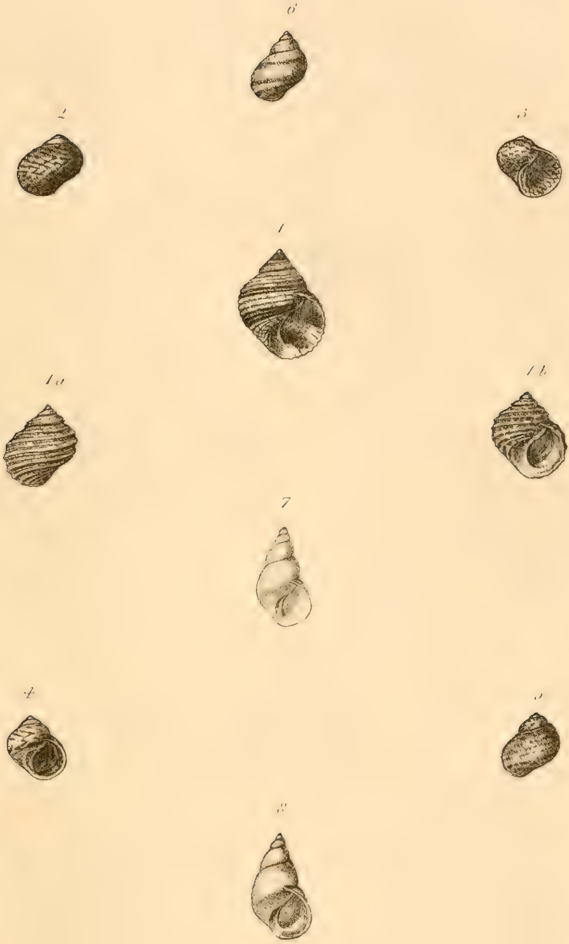

3
1
2
4
5
6
7
8
9
10

1 to 5. Litorina tenebrosa.

6 to 10. L. patula.

London Published by John Van Voorst 1856

PLATE LXXXVI.

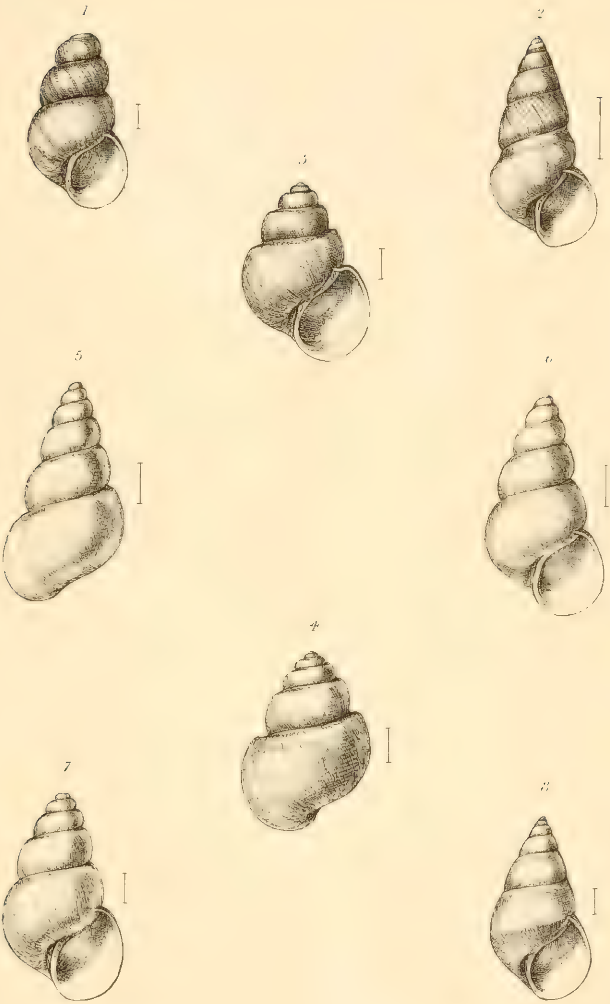

6
2
3
1
1a
1b
7
4
5
8

1. Lit. rudis, vars. 2, 3. L. fabalis. 4, 5. L. saxatilis

6. Lacuna vineta; var. quadrifasciata.

7, 8. Lac. vineta. var. labiosa.

PLATE LXXXVII.

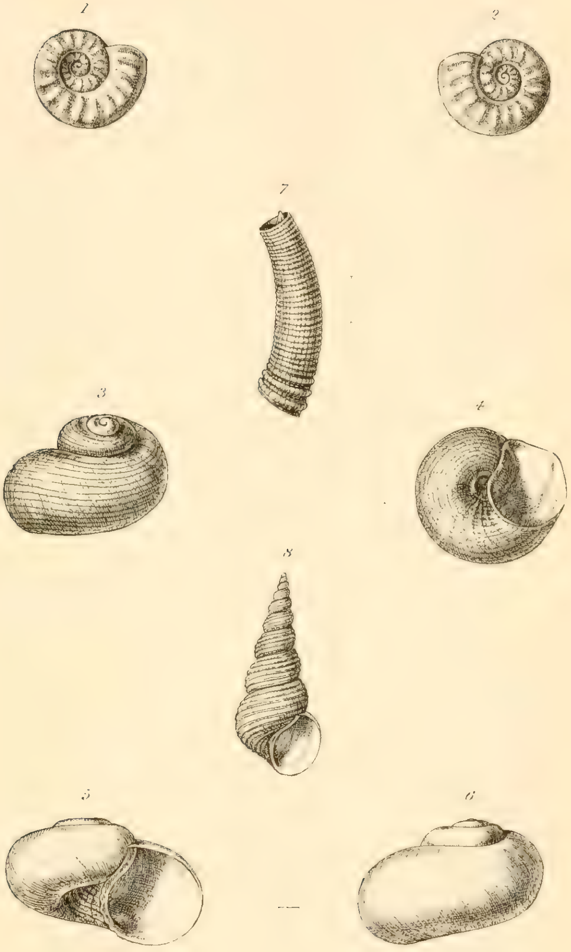


1.5.6.7. Rissoa ventrosa.

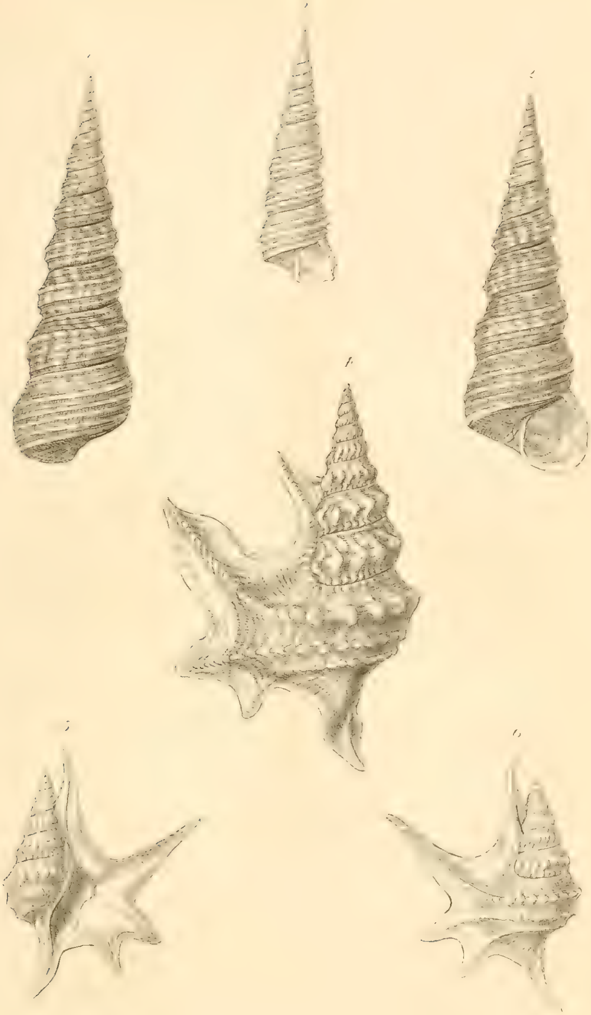
2.8. R. ulvæ, vars.   3.4. R. anatina.

London. Published by John Van Voorst 1850.

PLATE LXXXVIII.



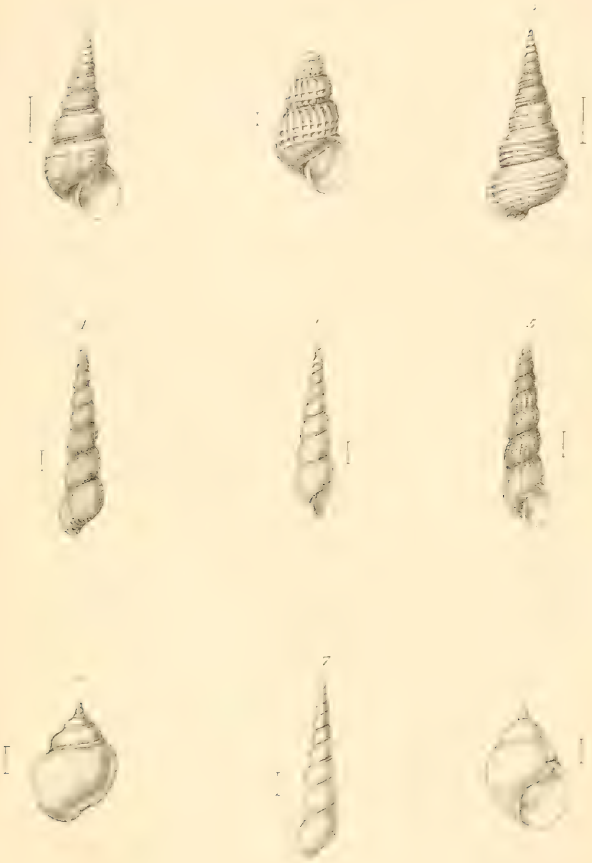
1, 2. Skenea rota. 3, 4. S. Cutleriana. 5, 6. S. lævis.
7. Cœcum annulatum. 8. Aclis ascaris.



1 2 Turritella communis. 3. do. var. nivea

4. Aporrhais pes-pelecani. 5. 6. A. pes-carbonis.

PLATE XC.



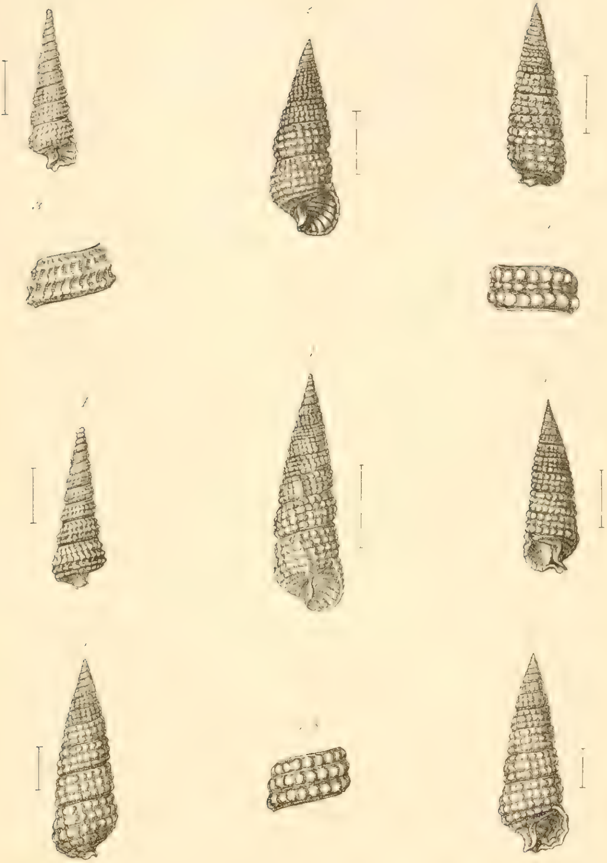
1. Rissoa eximia. 2. 3. Aclis supranitida.

4. 5. A. unica. 6. 7. A. nitidissima.

8. 9. Stylifer Turtoni.

London, Published by John Van Voorst. [illegible]

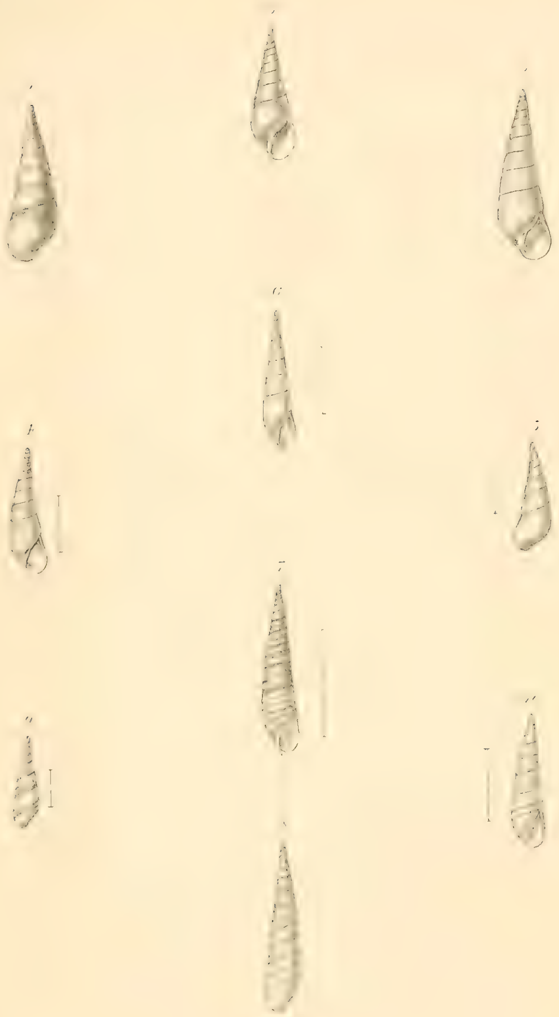
PLATE XCI.



1.2. Cerithium reticulatum. 3.4. C. metula

5. 6. C. adversum. 7. 8. Cerithopsis tuberculare

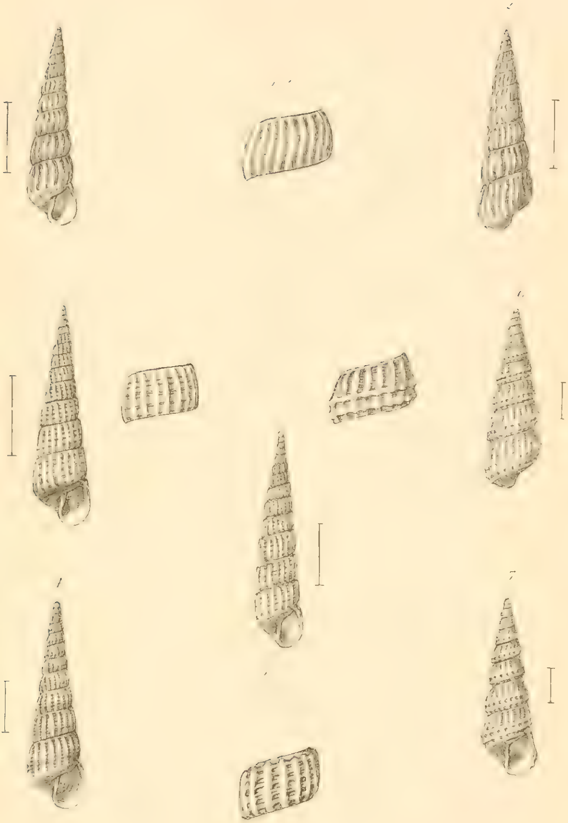
PLATE XCII.



1. 2. Eulima polita. 3. do. var. nitida. 4. 5. E. distorta.
6. do. var. gracilis. 7. 8. E. subulata. 9. 10. E. bilineata.

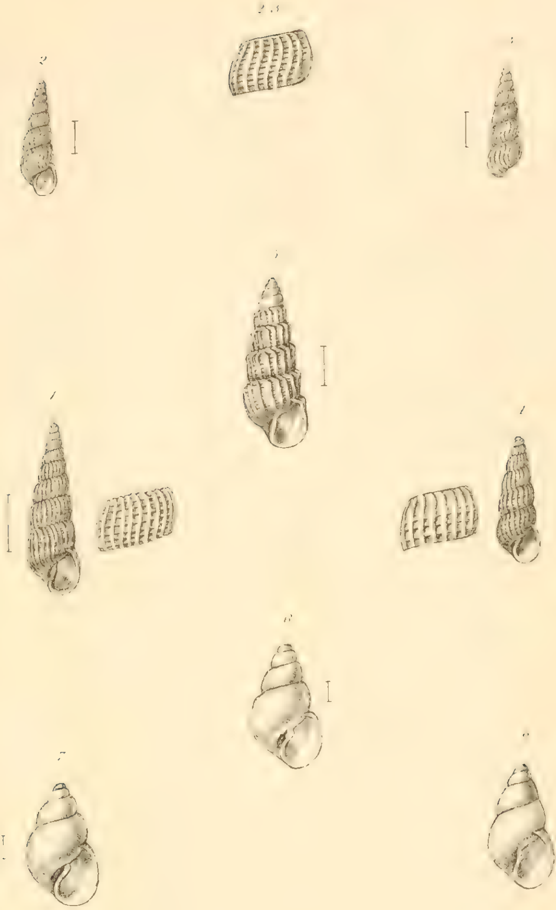
London. Published by John Van Voorst. 1856.

PLATE XCIII.



1.2. Chemnitzia elegantissima. 3.4. C. rufa.

5. C. formosa. 6.7. C. fenestrata.



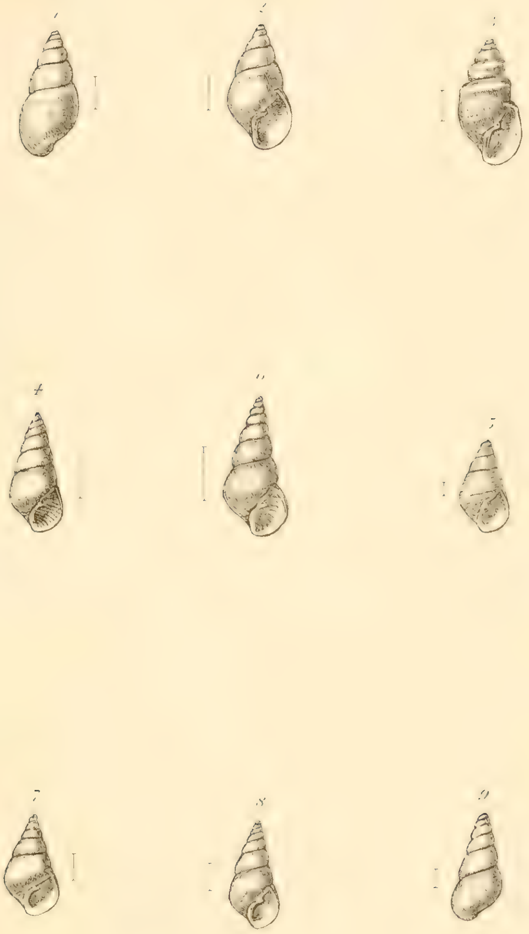
1. Chemnitzia rufescens. 2.3. C. indistincta.

4. C. clathrata. 5. C. scalaris.

6. Odostomia nitida. 7. do. var? 8. unidentata var. turrita.

London. Published by John Van Voorst 185

PLATE XCV.

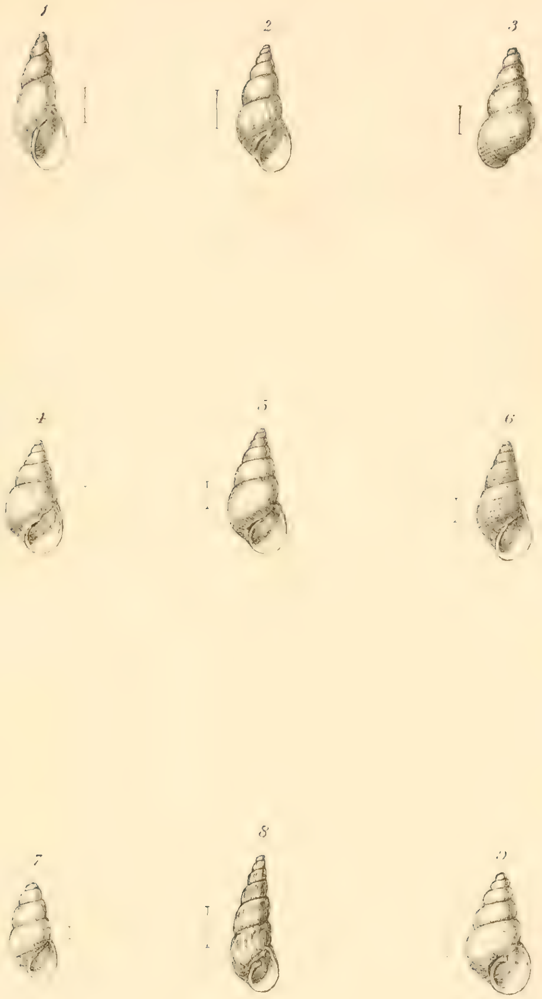


1.2. Odostomia Eulimoides. 3. do. var. crassa.

4. O. conoidea. 5. O. striolata. 6. O. conspicua.

7. 8. O. unidentata. 9. do. var. turrita.

PLATE XCVI.

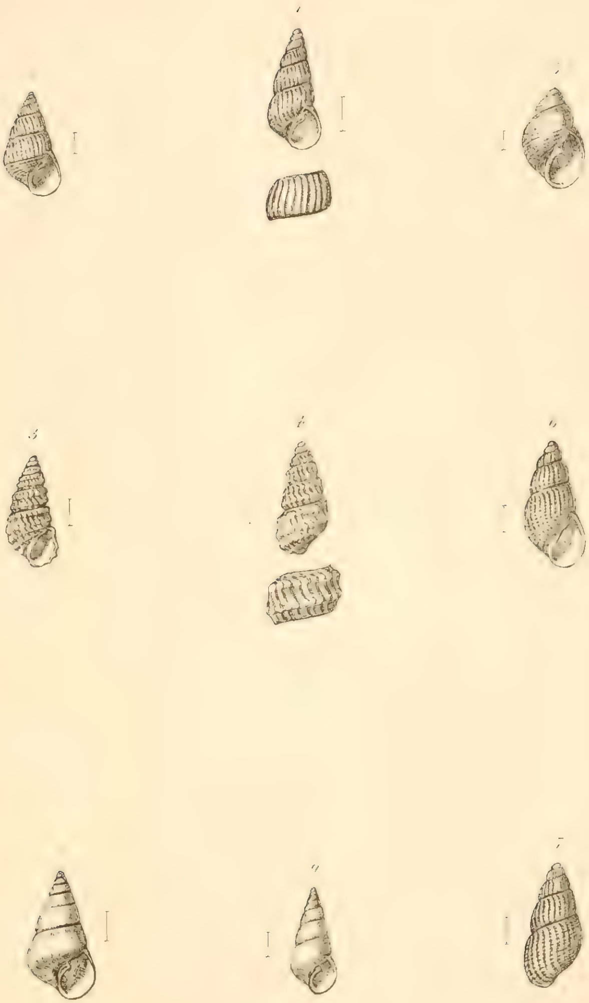


1. Odostomia obliqua. 2. 3. O. Warrenii. 4. O. Rissoides.

5. do. var. albella. 6. O. insculpta.

7. O. cylindrica. 8. O. truncatula. 9. O. alba.

PLATE XCVII.

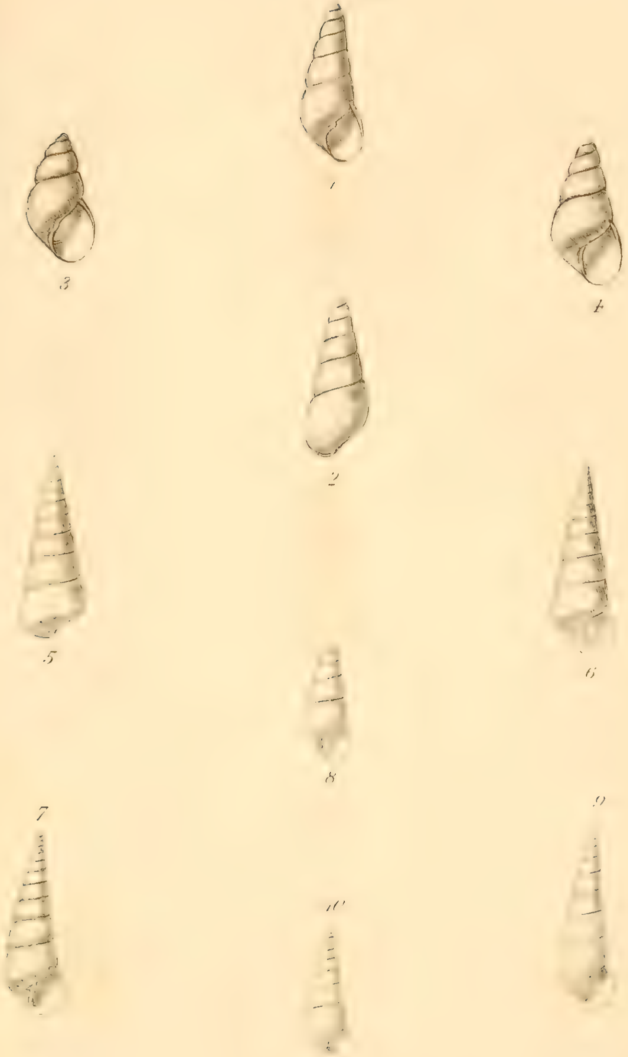


1. Odostomia interstincta. 2. O. spiralis.

3. 4. O. excavata. 5. O. dolioliformis.

6 7. O. decussata. 8. 9. O. acuta

London Published by John Van Voorst. 18[illegible]



G B Sowerby, Jun. exc.

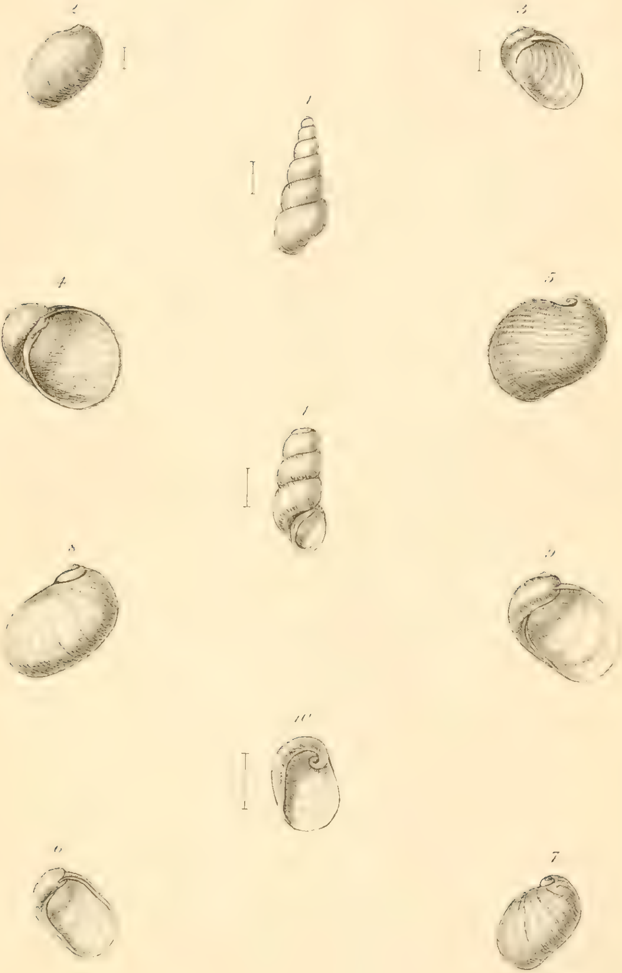
1.2. Odostomia plicata. 3. O. glabrata. 4. O! pallida.

5.6. Eulimella Scillæ. 7. E. affinis.

8. E. clavulus. 9.10. E. acicula.

London: Published by John Van Voorst, 1851.

PLATE XCIX.



G. B. Sowerby Jun.r sc.

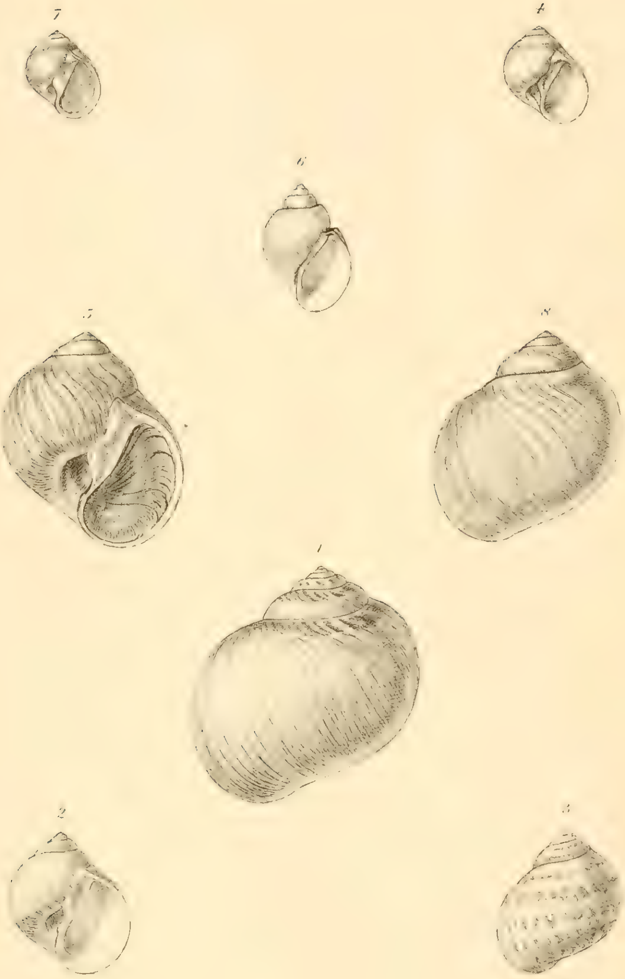
1. Truncatella Montagui 2. 3. Otina otis.

4. 5. Velutina lævigata. 6. 7. V. flexilis.

8. 9. Lamellaria perspicua. 10. L. tentaculata.

London. Published by John Van Voorst. 18

PLATE C

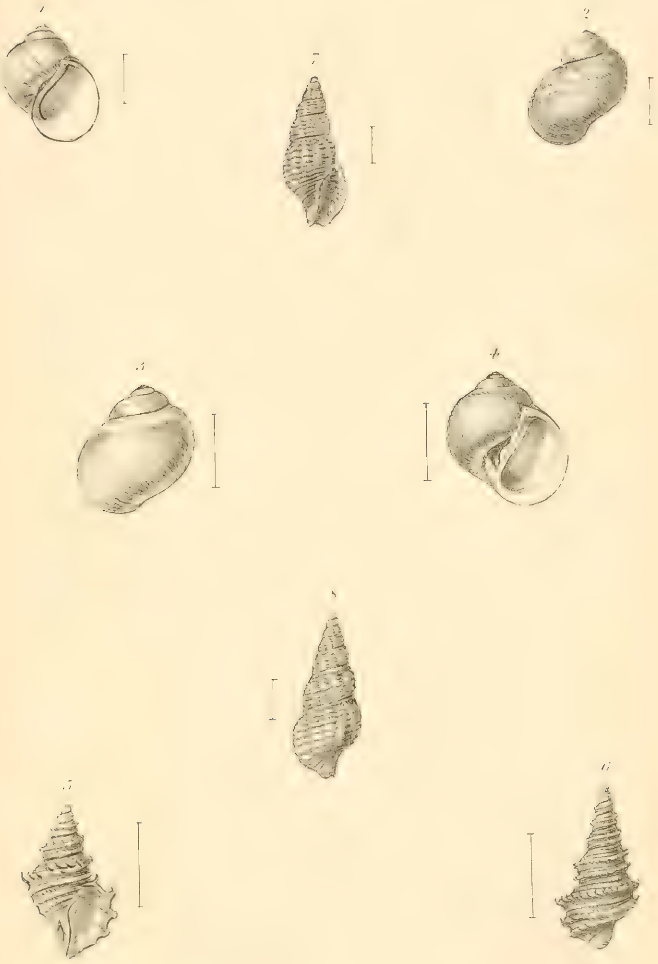


1. Natica monilifera. 2. 3. 4. N. nitida

5. 8. N. sordida. 6. N. Helicoides. 7. N. pusilla

London: Published by John Van Voorst 1851.

PLATE CI.



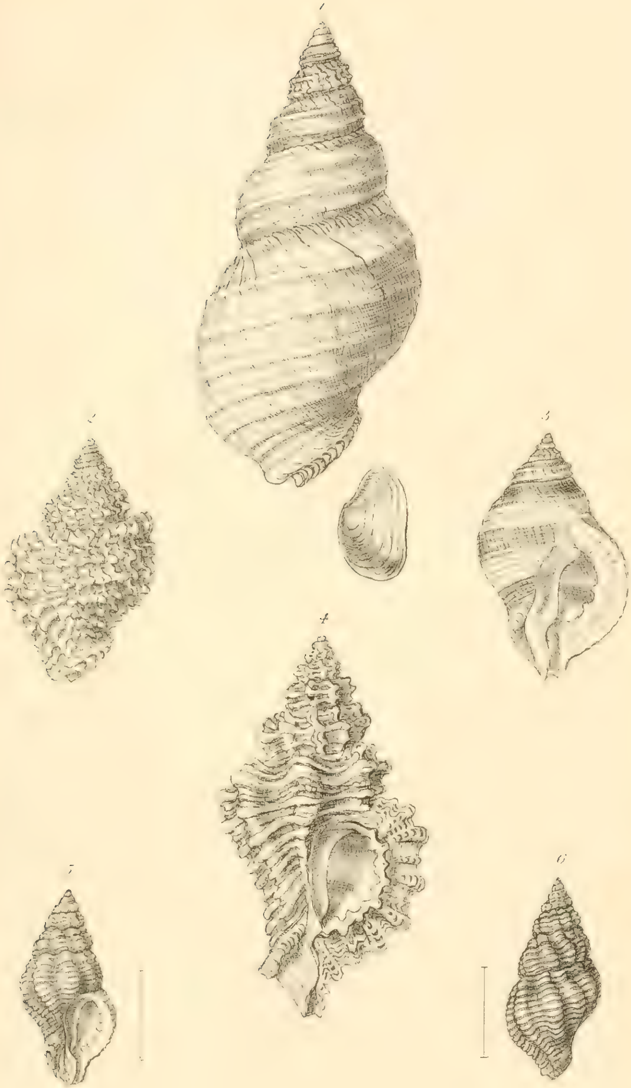
1.2. Natica Kingii. 3.4. N. Montagui.

5.6. Trichotropis borealis.

7.8. Lachesis minima.

London Published [illegible]

PLATE CII.

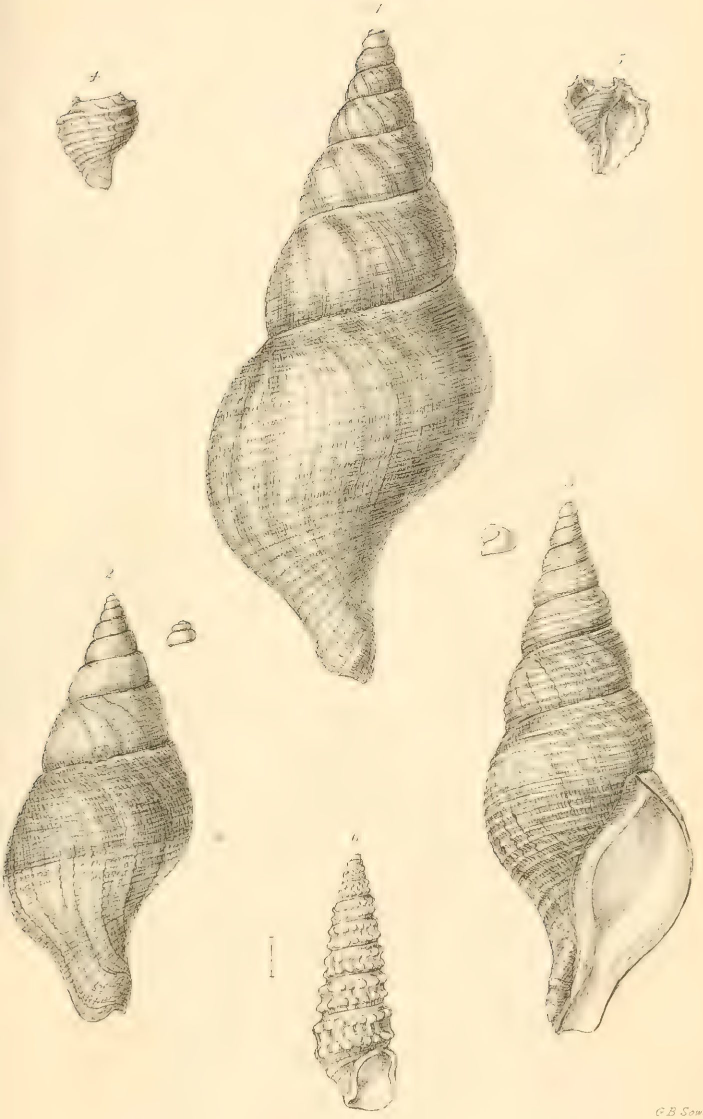


1.2.3. Purpura lapillus.

4. Murex erinaceus. 5.6. M. coralinus.

London, Published by John Van Voorst, 1851.

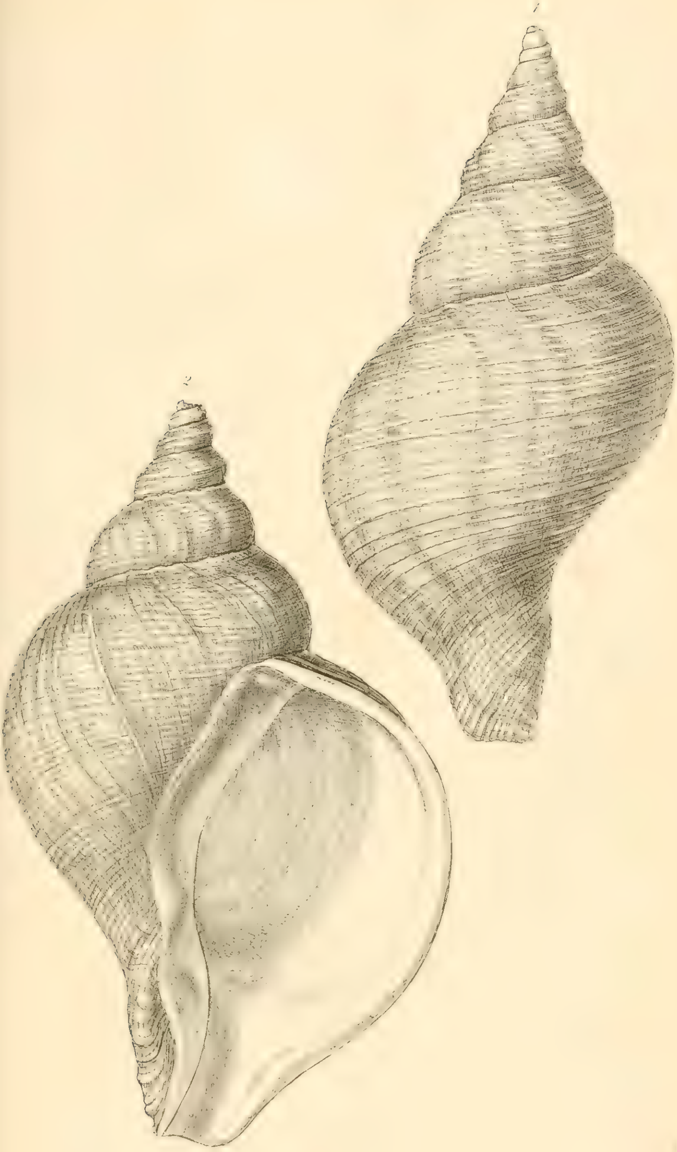
PLATE CIII.



G B Sowerby, Jun. exc.

1. 3. Fusus Islandicus. 2. F. propinquus.

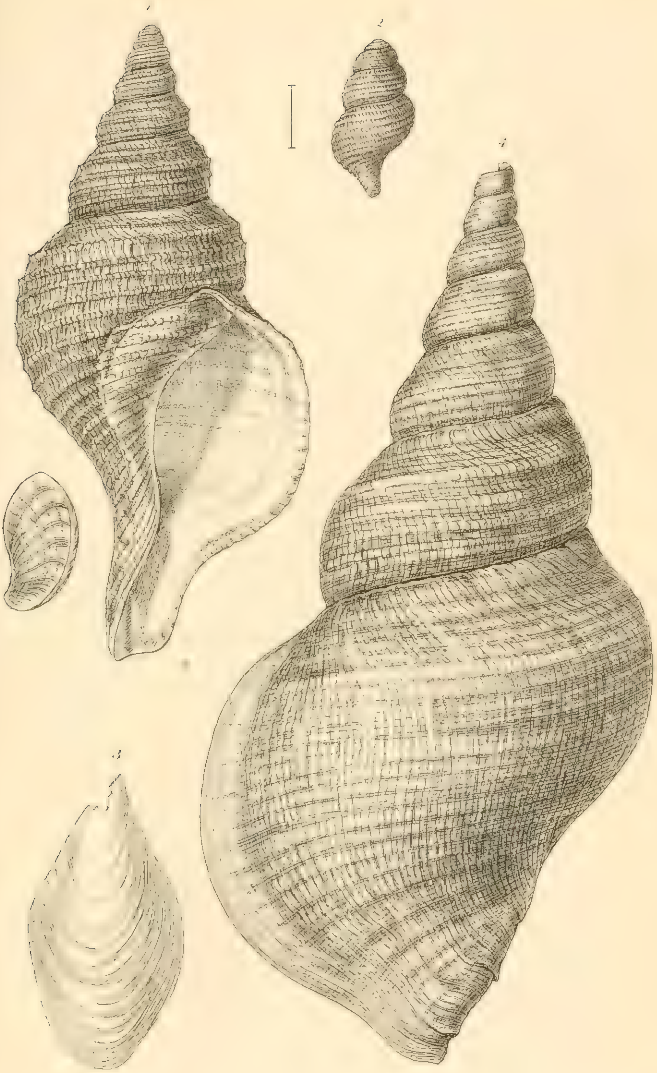
4. 5. F. (fragment from Zetland.) 6. Cerithiopsis tubercularis, var?



1. 2. Fusus antiquus.

London. Published by John Va

PLATE CV.



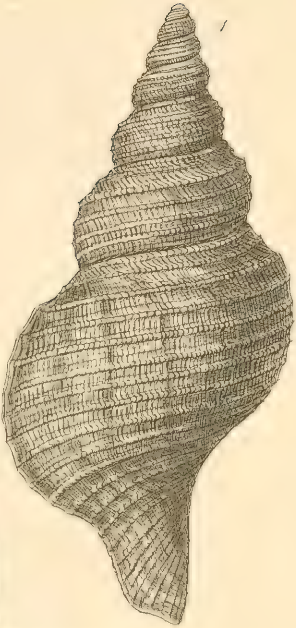
G. B. Sowerby Junr exc.

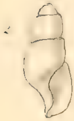
1. 2. Fusus Berniciensis.

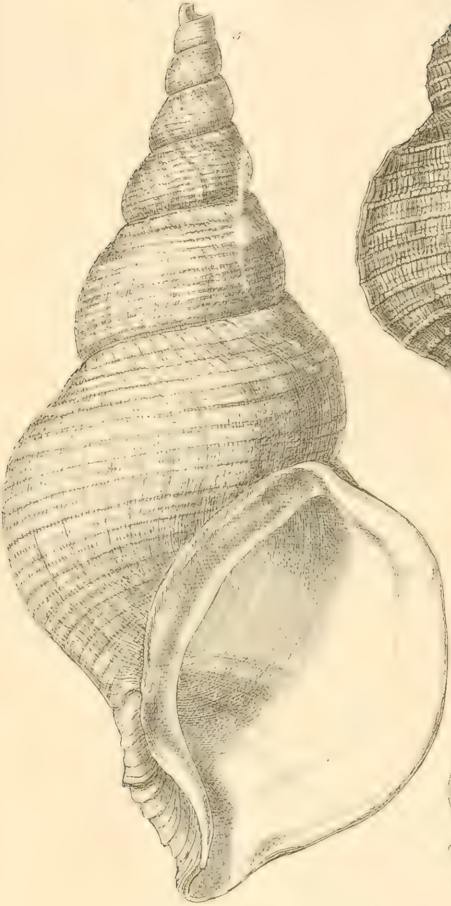
3. 4. F. Turtoni.

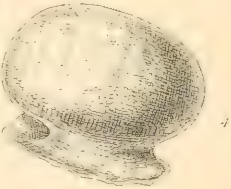
London Published by John Van Voorst. 1851

PLATE CVI.







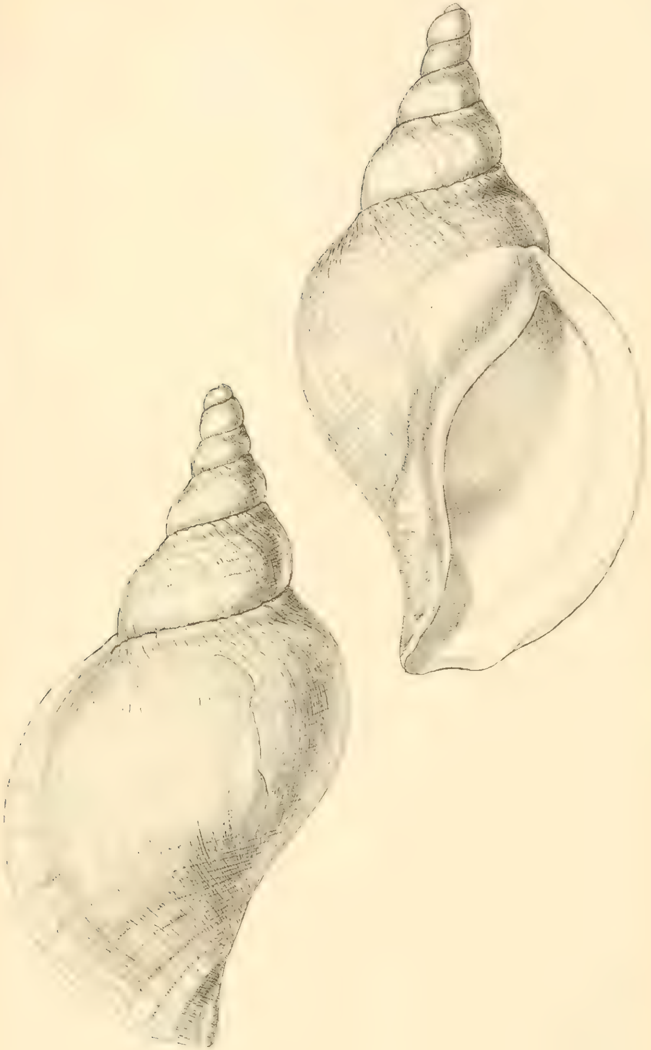


G. B. Sowerby Junr exc

1, Fusus Berniciensis.

2, 3, 4. F. Turtoni.

London. Published by John Van Voorst, 1851.

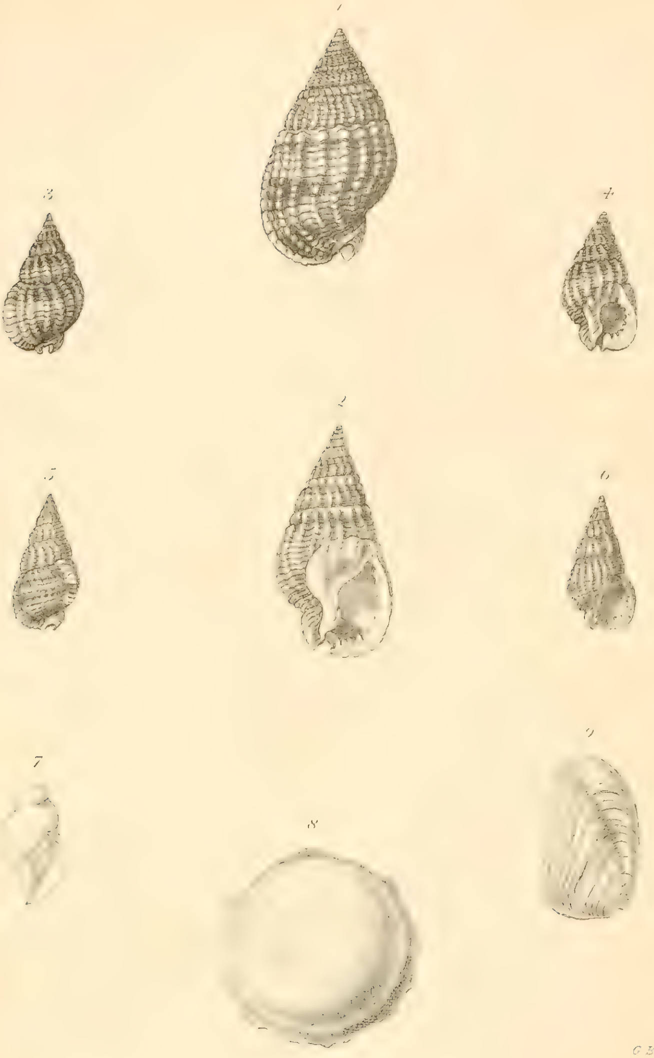


J. B. Sowerby Junr. exc.

Fusus Norvegicus. (a little reduced.)

London, Published by John Van Voorst, 1851.

PLATE CVIII.



G. B. Sowerby, Junr. exc.

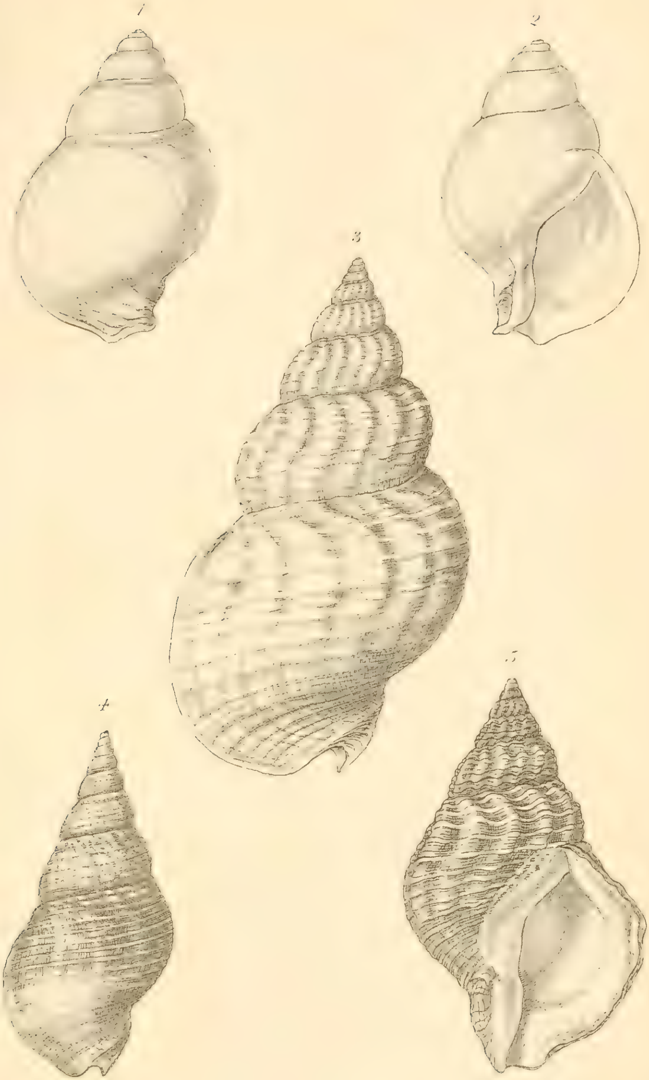
1.2. Nassa reticulata. 3.4. N. incrassata.

5.6. N. pygmæa. 7. F. Norvegicus, embryo.

8. do. capsule. 9. do. operculum.

London. Published by John Van Voorst. 1851.

PLATE CIX.

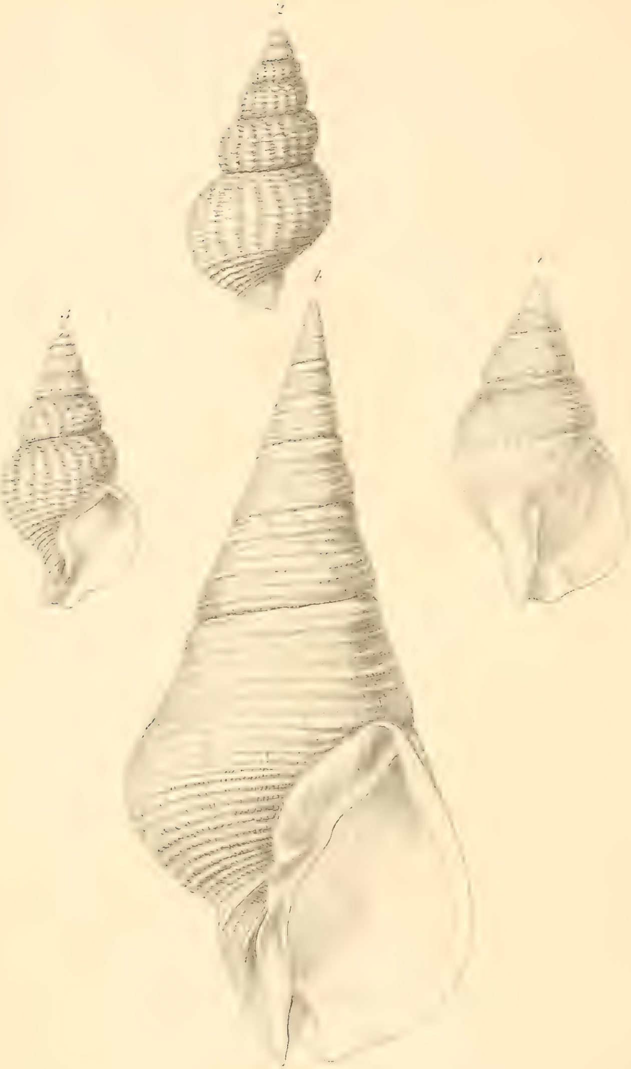


G. B. Sowerby Jun.r exc.

1. 2. Buccinum Dalei. 3. 4. 5. B. undatum.

London. Published by John Van Voors : 1851.

PLATE CX



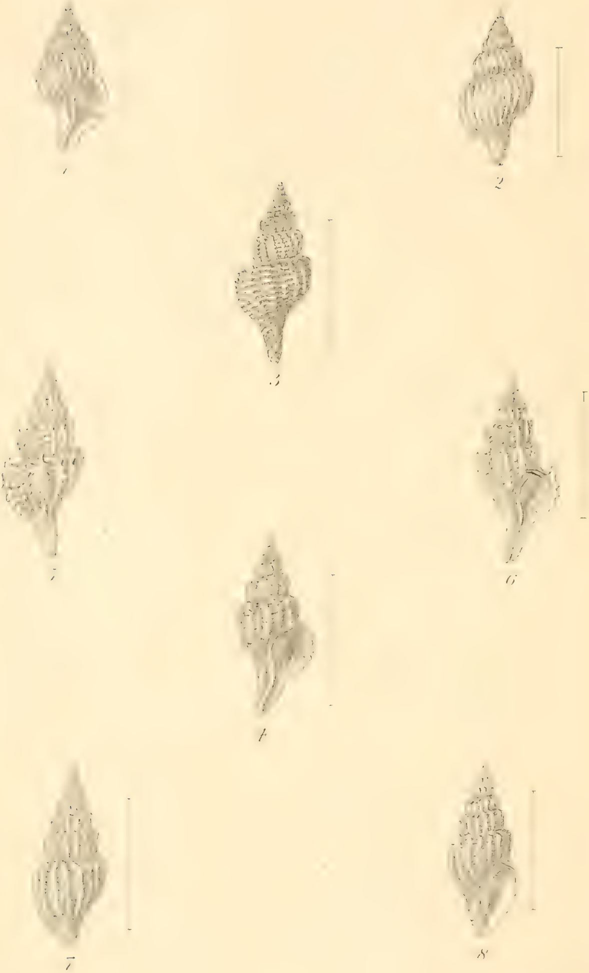
G.F.

1. Buccinum Humphreysianum.

2. 3. B. fusi forme. 4. B. undatum, var. acuminatum.

lith by Van Voorst 5

PLATE CXI.



J.E. Sowerby Jun.r sc.

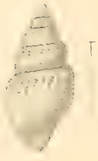
1.2. Trophon clathratus.

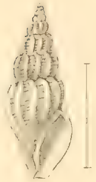
3.4. T. muricatus. 5.6. T. Barvicensis.

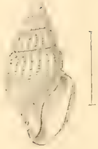
7.8. Mangelia turricula.

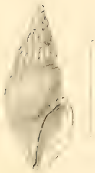
London. Published by John Van Voorst. 1851.

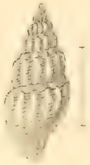
PLATE CXII.

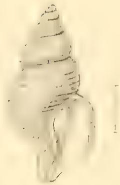

1

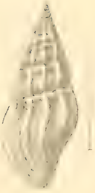

5

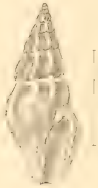

2


3


4


8


6


7

G. B. Sowerby Jun. Fec.

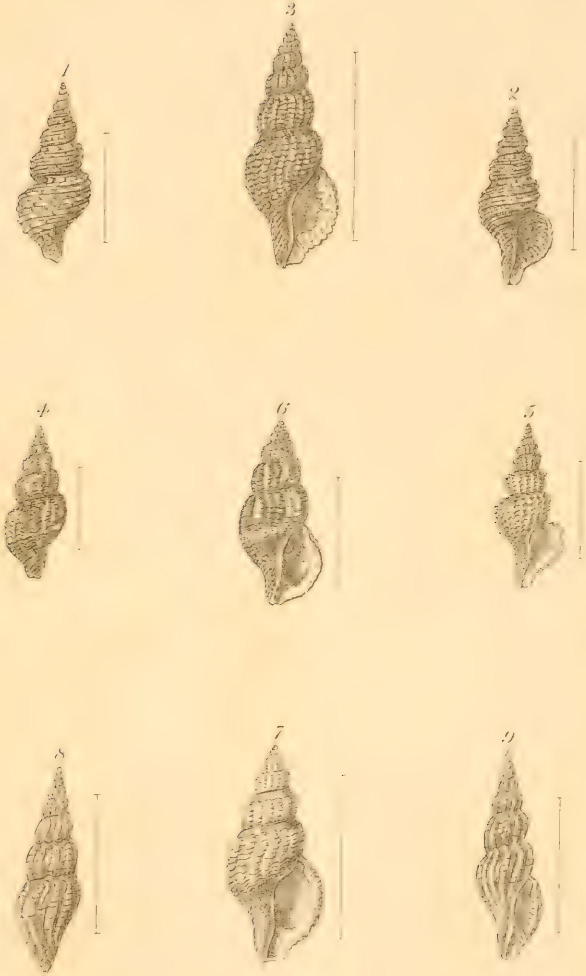
1.2. Mangelia Trevelliana. 3.4. M rufa.

5. do. var. Ulideana.

6.7. M. septangularis. 8. M. nana.

London. Published by John Van Voorst. 1851.

PLATE CXIII.



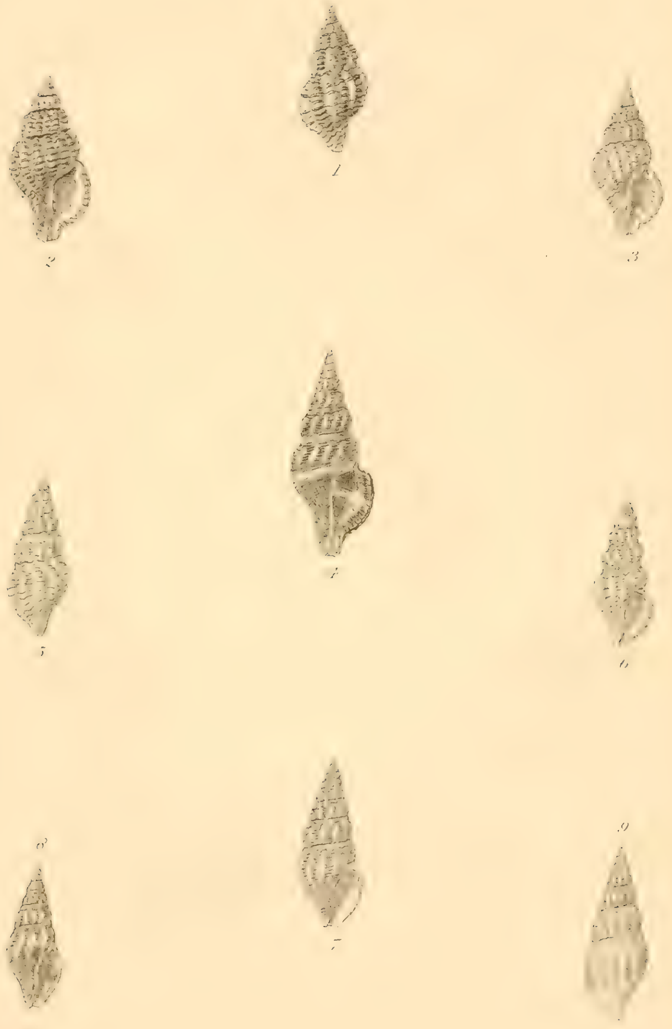
G.B. Sowerby Junr.

1.2. Mangelia teres. 3.4. M. purpurea. 5. do. var. asperrima.

6.7 M. Leufroyi. 8.9. M. attenuata.

London, Published by John Van Voorst. 1851.

PLATE CXIV.



G.B. Sowerby, Jun.r exc.

1.2.3 Mangelia linearis. 4. M. gracilis.

5. 6. M. brachystoma. 7.8.9. M. nebula.

London. Published by John Van Voorst. 1851.

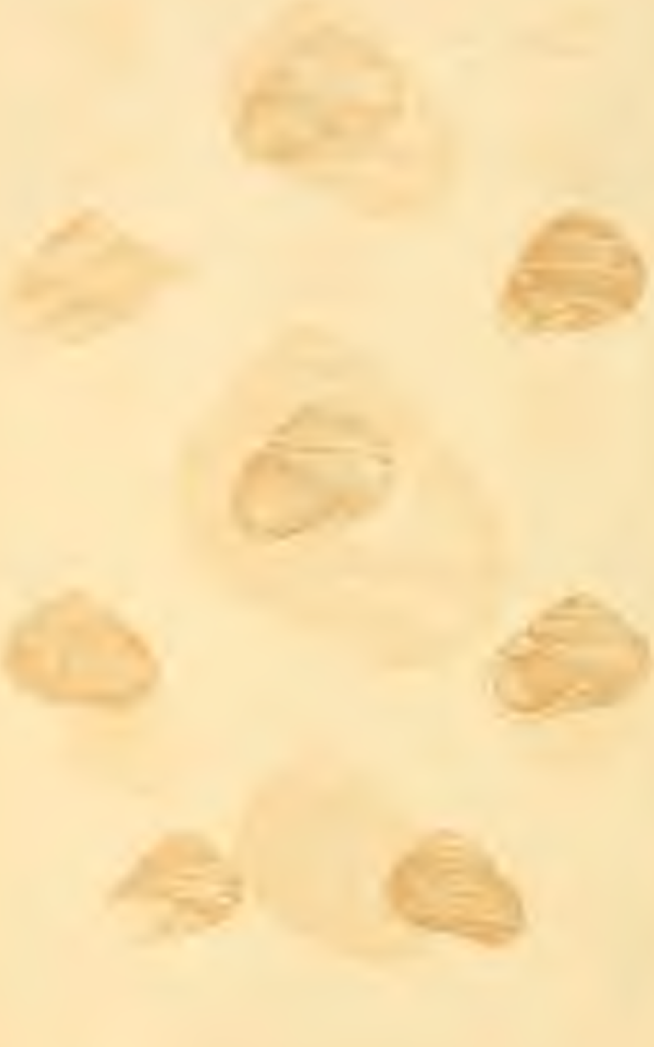
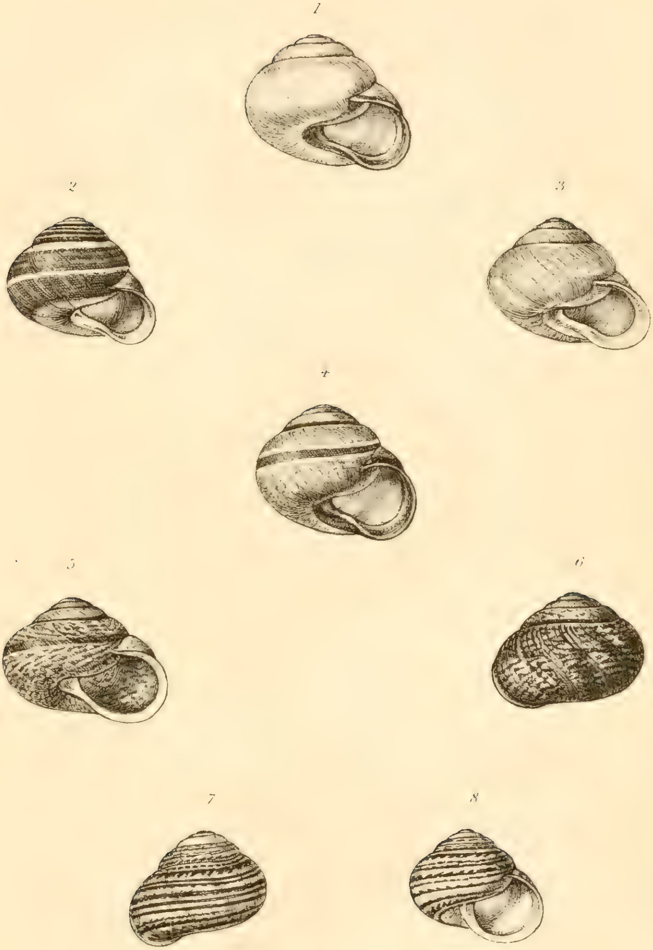


PLATE CXV.

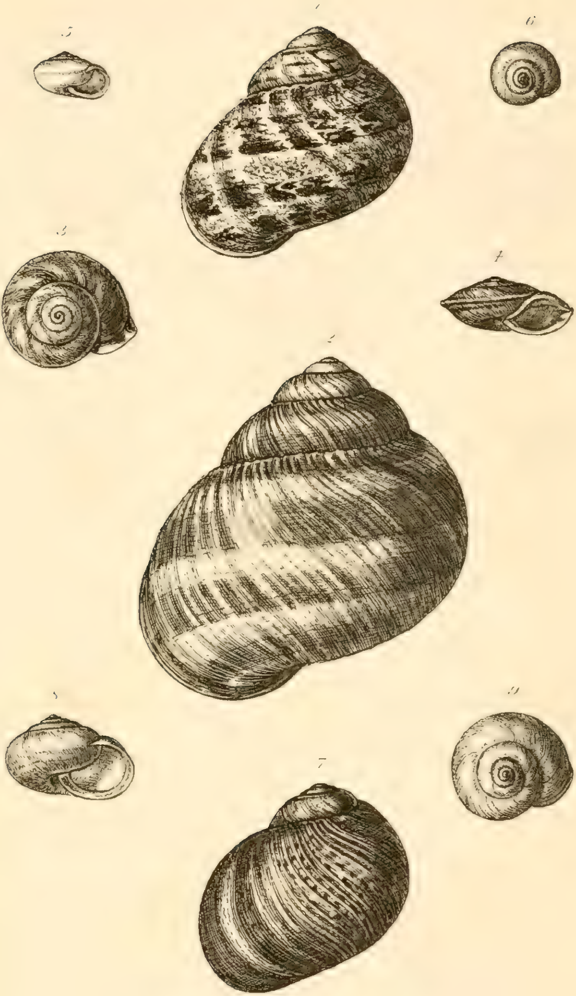


1 to 4. Helix nemoralis.

5. 6. H. arbustorum. 7. 8. H. Pisana.

[illegible]

PLATE CXVI

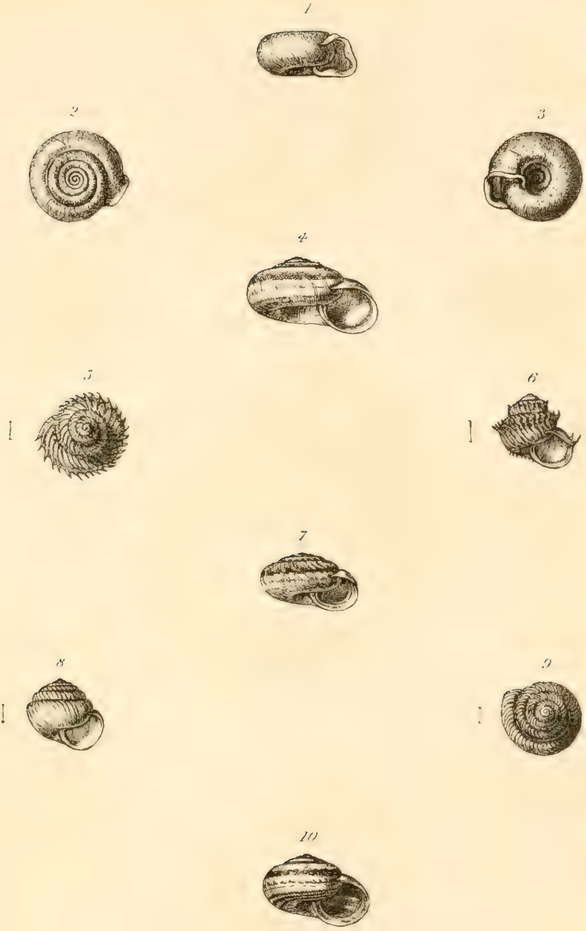


1. Helix aspersa. 2. H. pomatia.

3. 4. H. lapicida 5. 6. H. Carthusiana.

7. H. aperta. 8. 9. H. Cantiana.

PLATE CXVII.

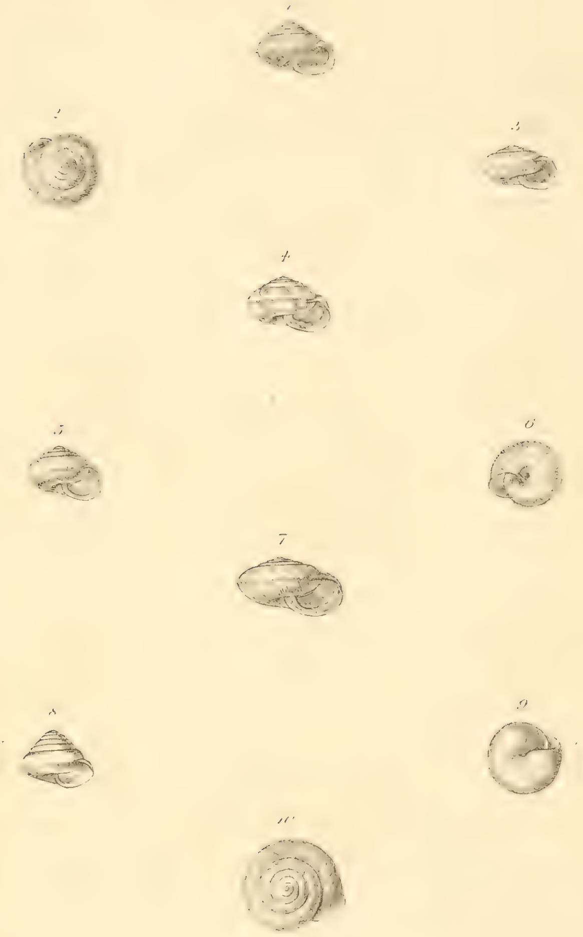

1
2
3
4
5
6
7
8
9
10

1. 2. 3. Helix obvoluta. 4. H. ericetorum

5. 6. H. aculeata.. 7. H. caperata

8. 9. H. lamellata. 10. H. virgata.

PLATE CXVIII.

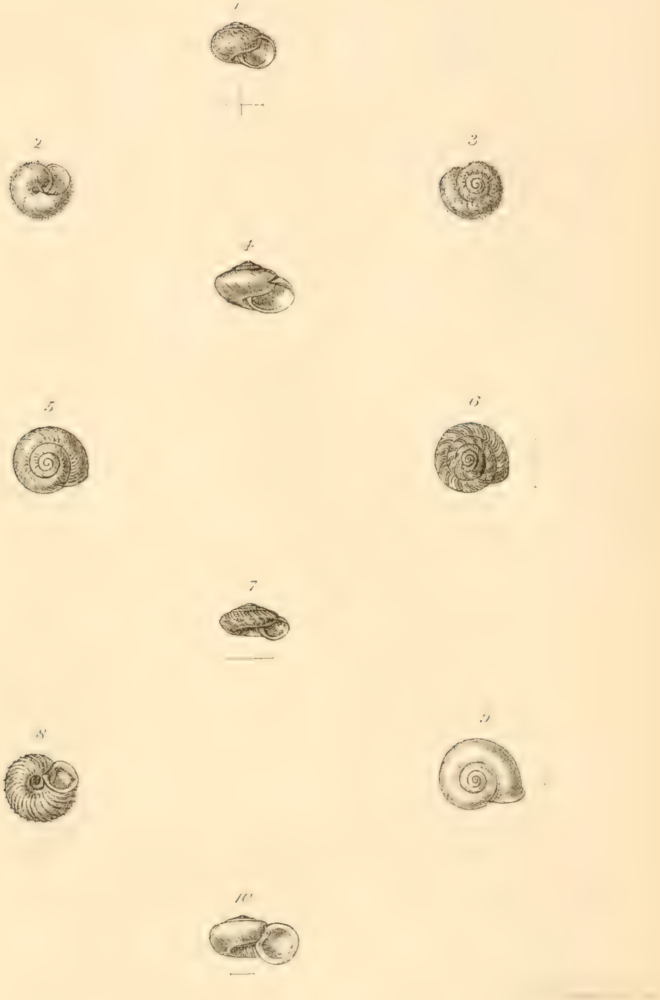


G. B. Sowerb, Junr sc.

1. 2. 3. Helix hispida. 4. 7. 10. H. rufescens.
5. 6. H. sericea. 8. 9. H. fulva

London. Published by John Van Voorst. 1850.

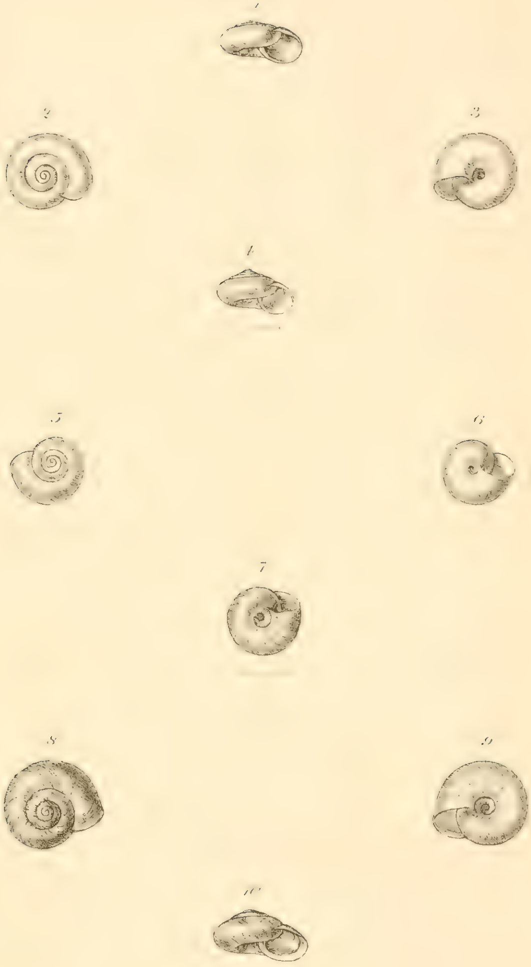
PLATE CXIX.


1
2
3
4
5
6
7
8
9
10

1. 2. 3, Helix revelata. 4. 5. H. fusca.
6. 7. H. rotundata. 8. 9. 10. H. pulchella.

London. Published by John Van Voorst. 185

PLATE CXX.


1
2
3
4
5
6
7
8
9
10

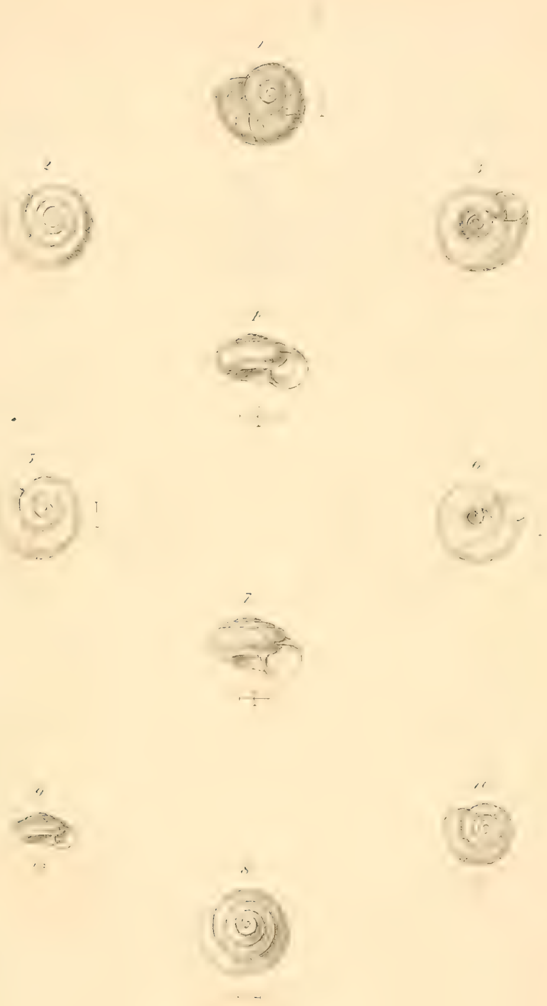
J. D. Sowerby Jun. sc.

1. 2. 3. Helix cellaria. 4. 7. H. nitida.

5. 6. H. alliaria. 8. 9. 10. H. nitidula.

London. Published by John V

PLATE CXXI.

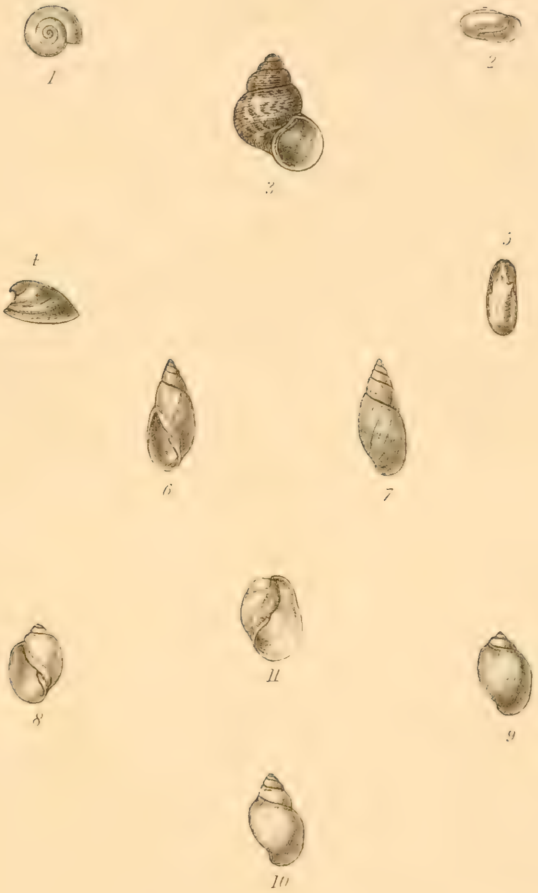


1. Helix radiatula. 2. 3. 4. H. excavata. 5. 6. H. pura

7. 8. H. umbilicata. 9. 10. H. pygmæa.

London. Published by John Van Voorst. 1850.

PLATE CXXII.



G.B. Sowerby, Junr. exc

1.2. Helix crystallina. 3. Cyclostoma elegans.

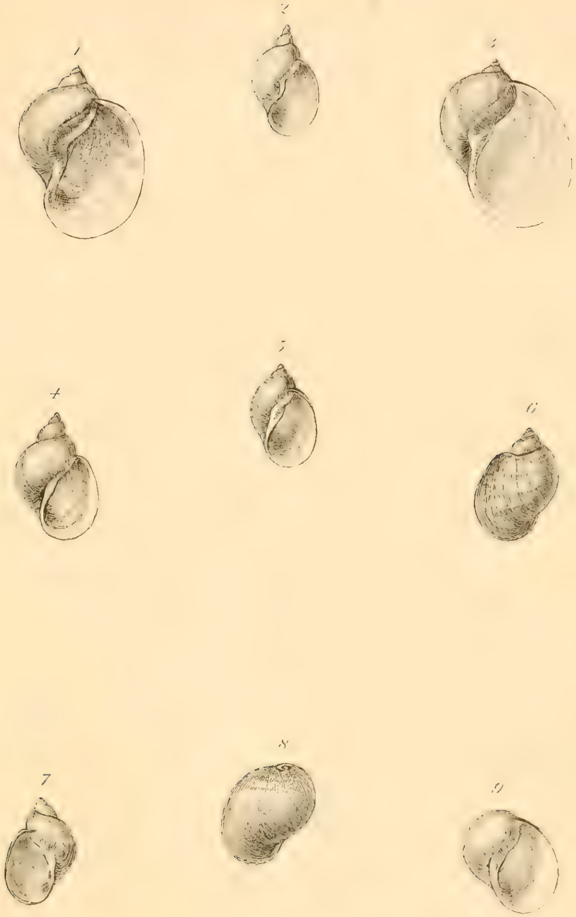
4. Ancylus fluviatilis. 5. A. oblongus.

6.7. Physa hyphorum. 8.9. P. fontinalis. 10. do. var.

11. Limnæus involutus.

London, Published by John Van Voorst 1852

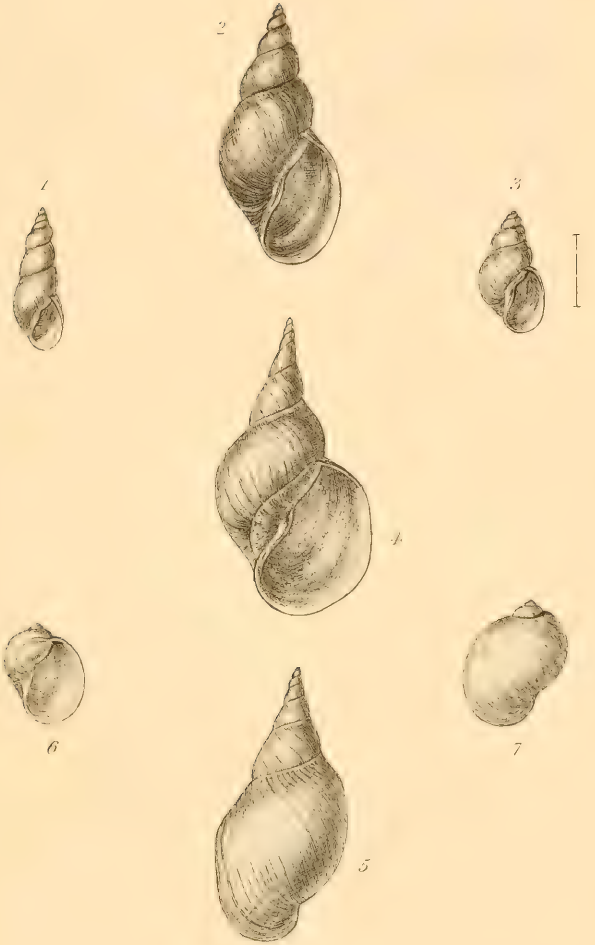
PLATE CXXIII.



1. Limnæus auricularius. 2. do. var. acuta.

3.4.5.6.7. L. pereger. 8.9. L. Burneti.

PLATE CXXIV.



G. B. Sowerby, Junr exc

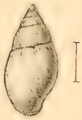
1. Limnæus glaber. 2. L. palustris.

3 L. truncatulus. 4. 5. L. stagnalis.

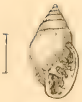
6. 7. L. glutinosus.

PLATE CXXV.

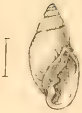
1



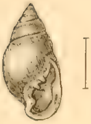
3



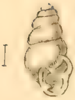
2



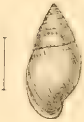
4



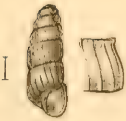
6



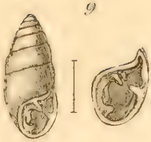
5



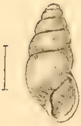
7



9



8



G B Sowerby Jun.r exc

1.2. Conovulus bidentatus. 3. C denticulatus.

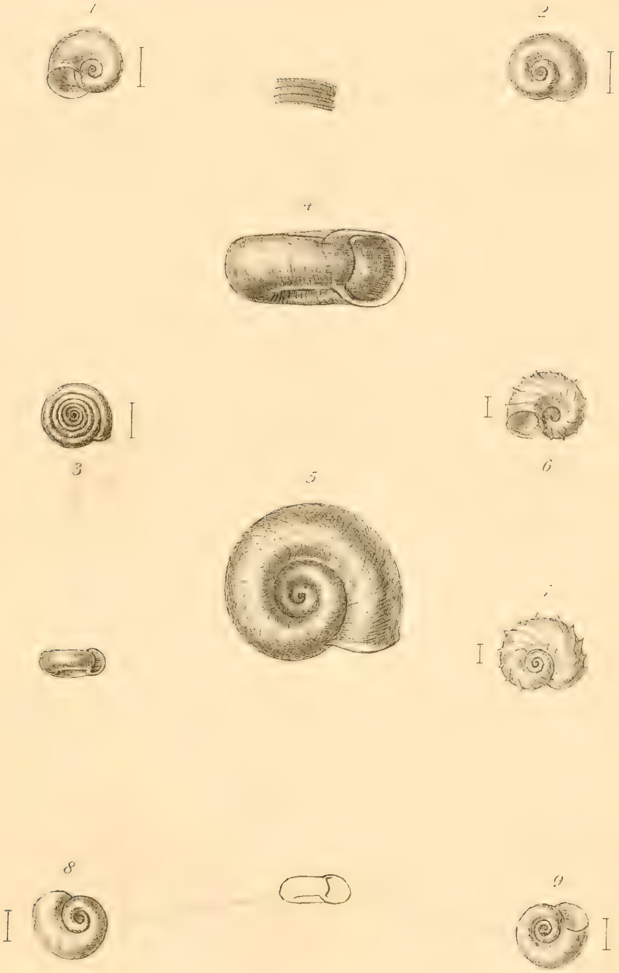
4.5. do. var. myosotis. 6. Carychium minimum

7. Acme fusca. 8. Zua lubrica.

9. Azeca tridens.

London Published by John Van Voorst, 1851.

PLATE CXXVI.

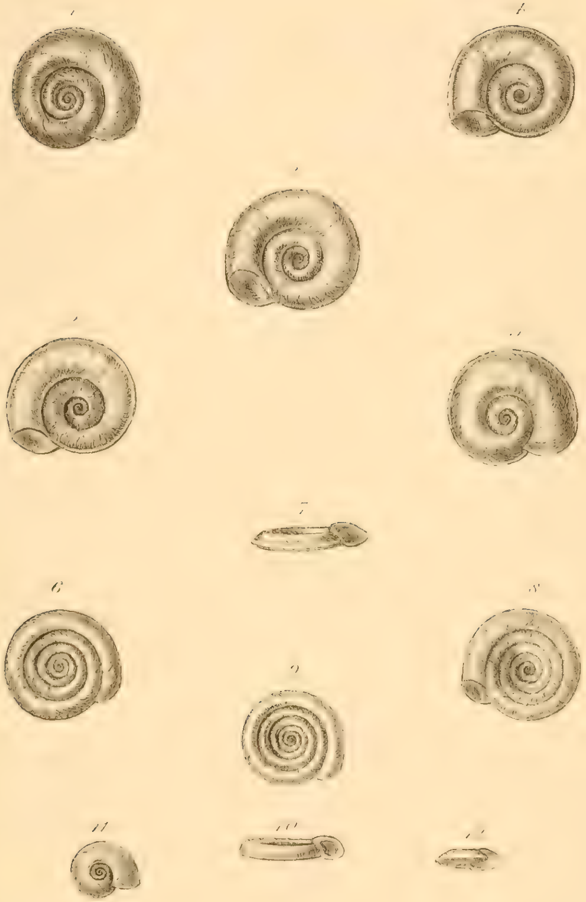


1.2. Planorbis albus. 3. P. contortus.

4. 5. P. corneus. 6.7. P. imbricatus.

8. 9. P. lævis.

PLATE CXXVII


1
2
3
4
5
7
6
8
9
11
10
12

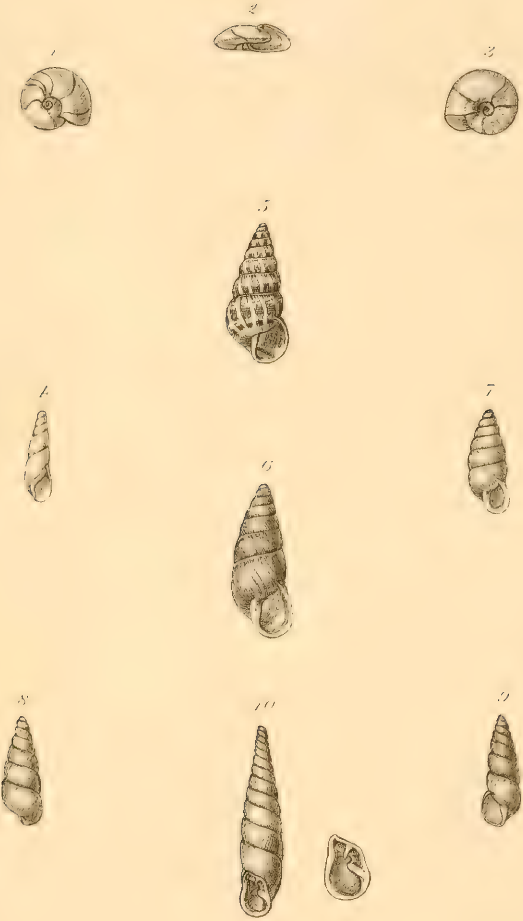
1.2. Planorbis marginatus. 3. do. var. rhombea.

4.5. P. carinatus. 6.7.8. P. vortex

9.10. P. spirorbis. 11.12. P. nitidus

London. Published by John Van Voorst. 1853.

PLATE CXXVIII.



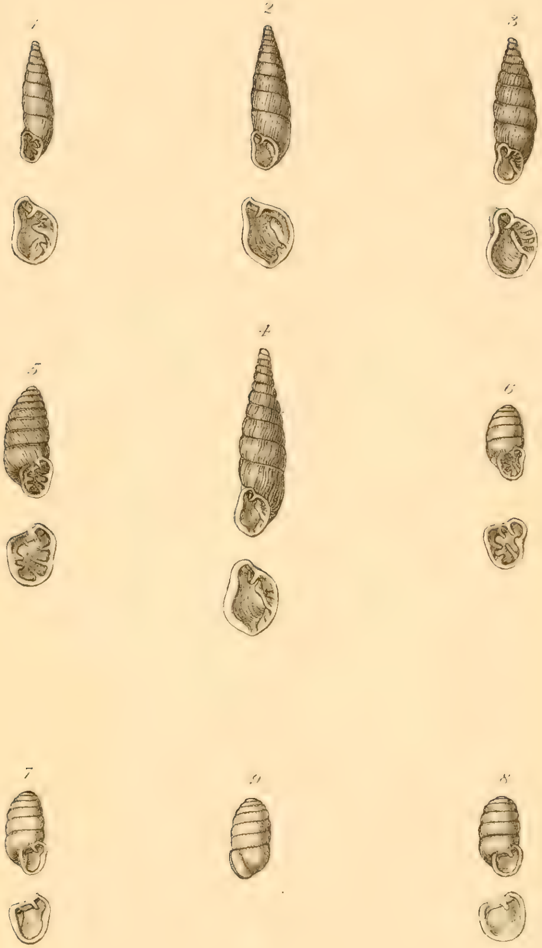
1.2.3. Planorbis lacustris. 4. Achatina acicula.

5. Bulimus acutus. 6. B. Lackamensis 7. B. obscurus.

8.9. Balea perversa.. 10. Clausilia laminata.

London. Published by John Van Voorst. 1852.

PLATE CXXIX



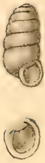
1. Clausilia nigricans. 2. do. var. dubia.

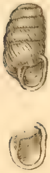
3. C. plicatula. 4. C. biplicata

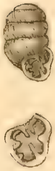
5 Pupa juniperi. 6. P. anglica.

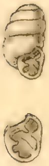
7. P. umbilicata 8. 9. P. muscorum.

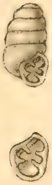
PLATE CXXX.

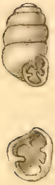
1


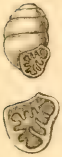
2


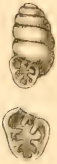
3


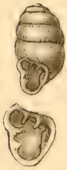
4


5


6


7


8


9


G B. Sowerby Jun

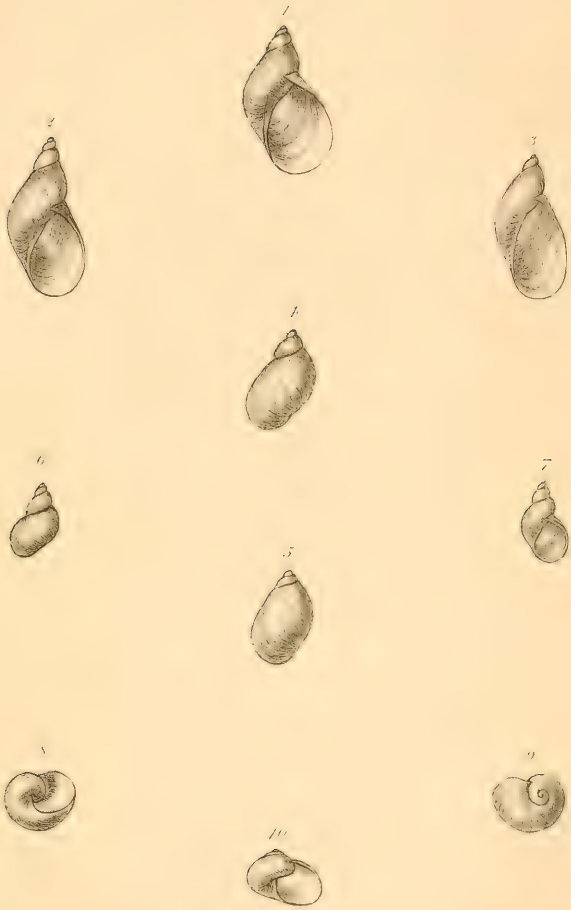
1. Pupa edentula. 2. P. minutissima.

3. P. substriata. 4.5. P. pygmæa. 6. do. var. alpestris.

7. P. antivertigo. 8. P. pusilla. 9. P. Venetzii.

[illegible] 1852

PLATE CXXXI.

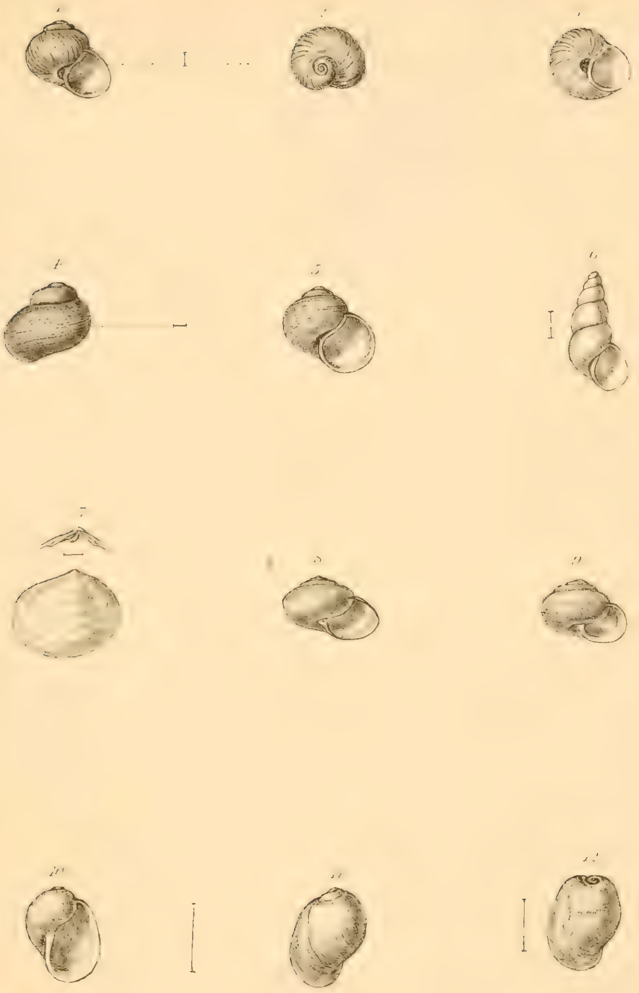

1
2
3
4
6
7
5
8
9
10

1 to 5. Succinea putris. 6.7. S. oblonga.

8.9.10. Vitrina pellucida.

London. Published by John Van Voorst.

PLATE CXXXII.



1.2.3. Skenea? costulata. 4.5. S.(Margarita) Cutleriana.

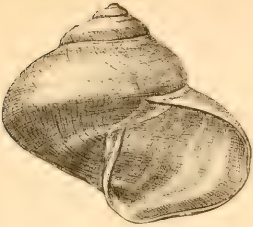
6. Odostomia? Gulsonæ. 7. Lepton Clarkiæ. 8. Helix fusca.

9. H. sericea. 10. 11. Limnæus pereger. var. lacustris.

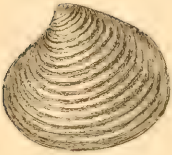
12. L. involutus.

PLATE CXXXIII

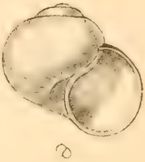
1



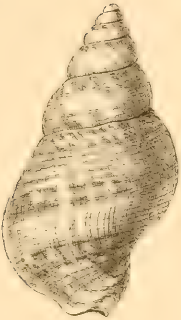
4



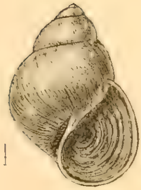
5



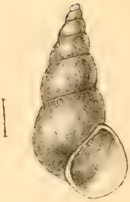
2



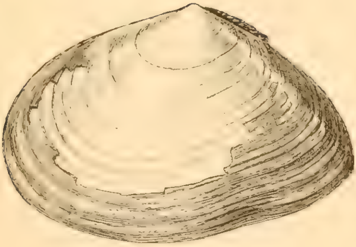
6



7



3



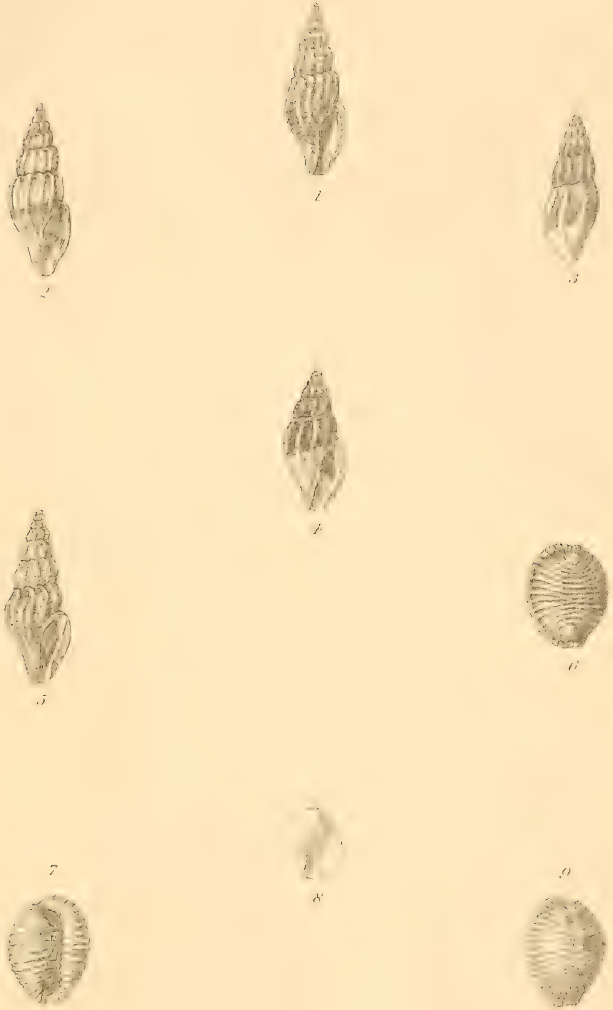
1. Ianthina communis.

2. Buccinum Humphreysianum. 3. Tellina proxima. var. calcarea.

4. Astarte sulcata. var. 5. Jeffresia globularis.

6. J. opalina. 7. Rissoa. ventrosa. var.

PLATE CXIV A.



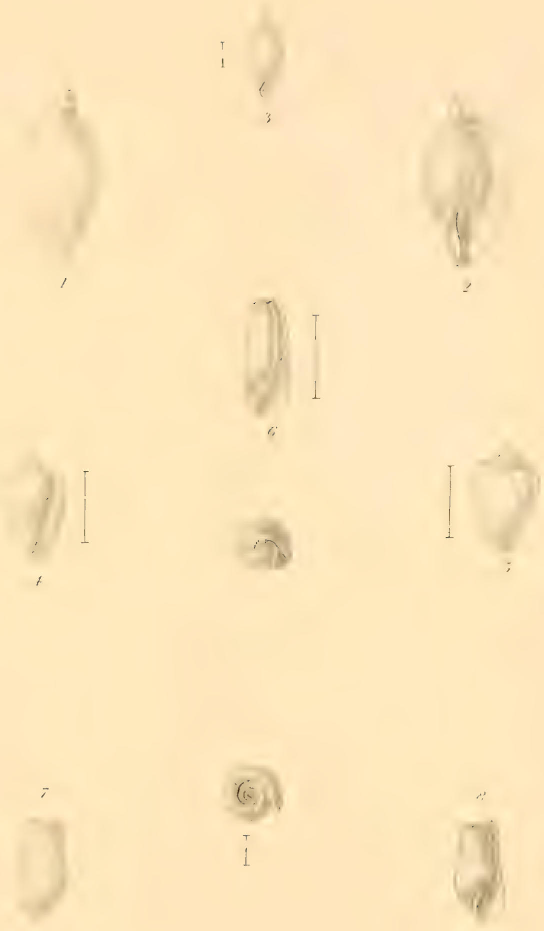
G.B. Sowerby Junr. exc.

1.2. Mangelia striolata. 3.4. M. costata.

5. do. var. coarctata. 6.7.8 9. Cypræa Europœa.

London, Published by John Van Voorst. 1851.

PLATE CXIV. B.



G.B. Sowerby Jun. fec.

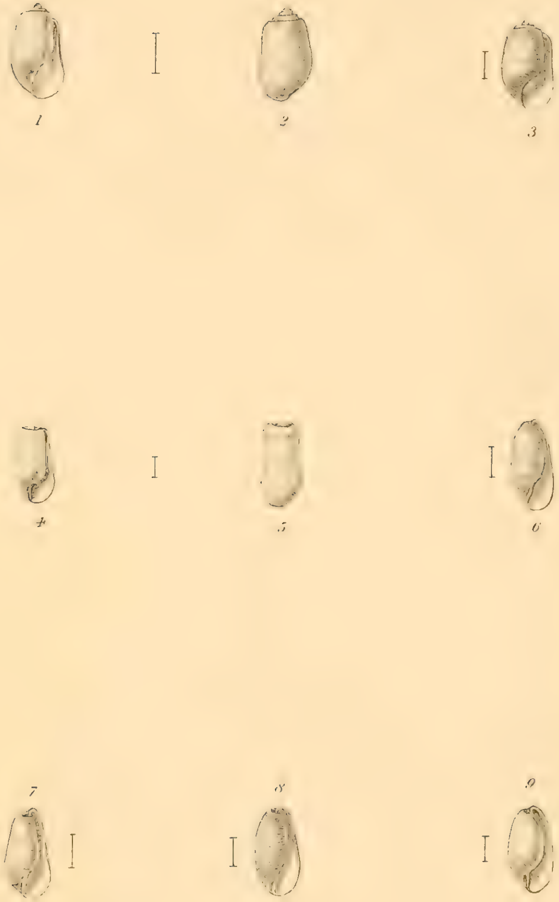
1.2. Ovula patula 3. O. acuminata.

4.5. Marginella lævis.

6. Cylichna cylindracea. 7.8. C. truncata.

London: Published by John Van Voorst, 1851.

PLATE CXIV. C.



G.B.Sowerby Jun.r exc

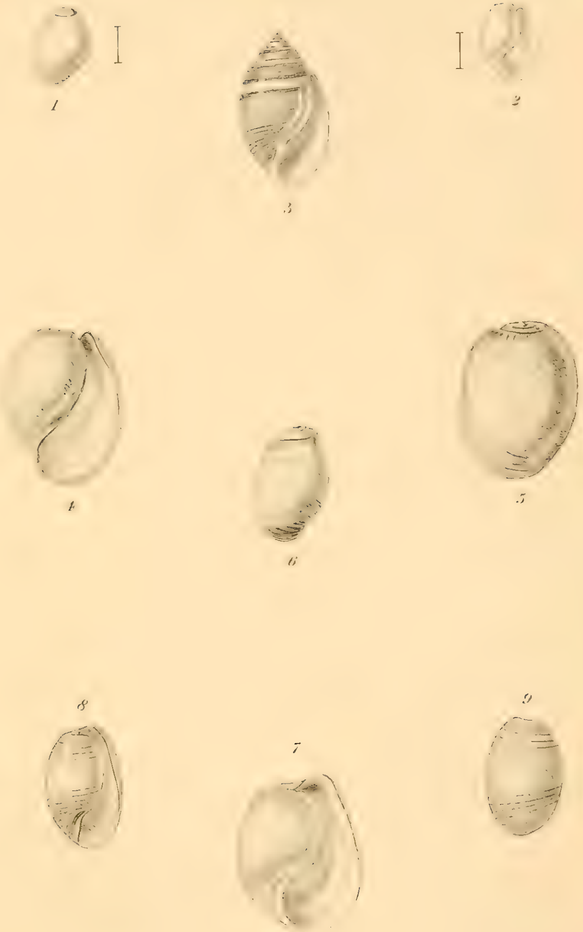
1.2.3. Cylichna obtusa. 4.5. C. mammillata.

6. C. nitidula. 7. C. conulus.

8. C. strigella. 9. C. umbilicata.

London: Published by John Van Voorst. 1851.

PLATE CXIV. D.



G B Sowerby Junr sc.

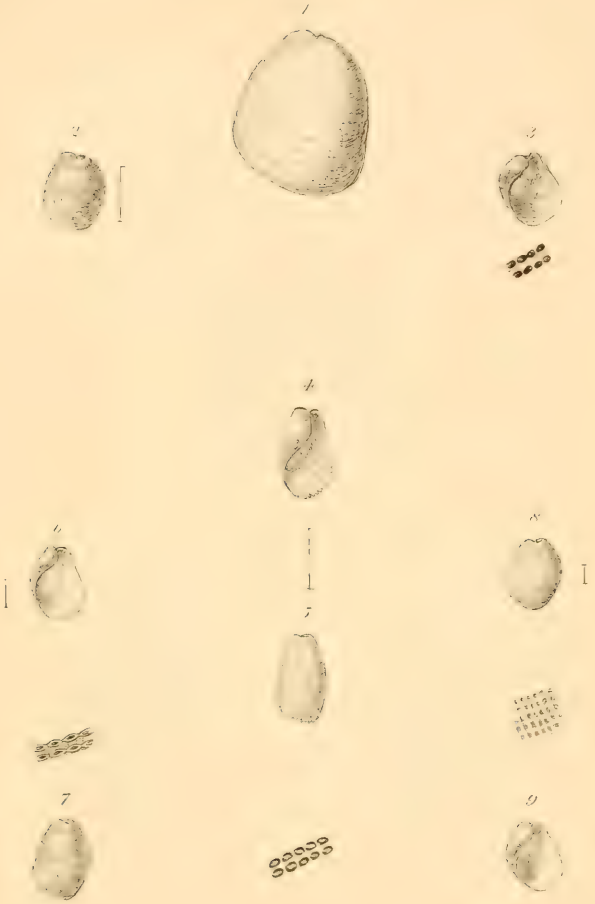
1.2. Amphispyra hyalina. 3. Tornatella fasciata.

4.5.6. Akera bullata.

7. Bulla hydatis. 8.9. B. Cranchii.

London, Published by John Van Voorst 1851.

PLATE CXIV. E.



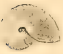
W. Smith, Li

1. Philine aperta. 2. 3. P. quadrata. 4. 5. P. scabra.

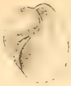
6. 7. P. catena. 8. 9. P. punctata.

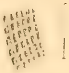
London. Published by John Van Voorst. 1851

1

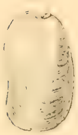


2

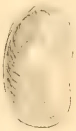




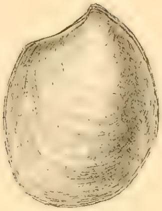
6



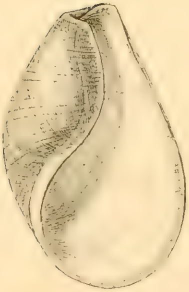
7



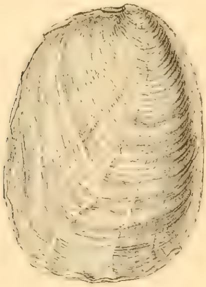
4



3



5



werby Jun' sc

1.2. Philine pruinosa. 3. Scaphander lignarius.

4. Aplysia hybrida. 5 Pleurobranchus membranaceus.

6. 7. P. plumula.

London, Published by John Van Voorst.

2

1363

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01348 6246